

MODEL AIRPLANE NEWS

APRIL 1950 • 25 CENTS



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WHY is one section of the country more active than another section? How is it that one club secretary will moan that things are dead while another tells you there is as much action as a Ceiling Walker in a telephone booth? It boils down to ideas and push. What kind of ideas? How do you push? Here's a sample.

Harold Bunting, jet record holder and past pres. of the Prop-Twisters Model Club, Greensboro, N.C., recently gave us this lowdown on the Twister's promotion and activities. So far, the club has had three of its monthly series of programs over television station WFMY-TV and thereabouts, in that brief time, modeling ranks next to Arthur Godfrey! The Twisters' variety of programs is tops in local appeal.

"We fly indoor models, helicopters, gliders, and hop planes in the studio for the camera," says Bunting. "This week we are demonstrating HO trains along with race cars and boats. We have had a program on theory and design. The 'little ones' have had special instruction from older members in construction and in flying."

Nor is this television program a special spurt; the Prop Twisters keep things cooking all year round regardless of who is watching. Helpful hints on construction are given at meetings and flying instructions each Sunday at the new club field in ORD, Greensboro (an old Army camp). A 35' concrete cable race track has been completed (fast time: 104.65 mph with Dooling #1 in Dooling Arrow). Indoor flying gets a play in the local gym but the boys are looking forward to a new Municipal Auditorium.

"Our club is self supporting," Harold continues. "We charge members two-dollars a year dues and AMA dues (which is a little less than 4½¢ per week). We have a concession stand at the field and sell soft drinks to keep the treasury going and hold four parties a year: wiener roast, watermelon slicing, initiation party, and Christmas party. Surrounding clubs are invited to compete in our yearly flying circus, and we give each a gift for flying."

"We do our own promotion for contests ever since a local civic organization left us in a hole for prizes two years ago. Coble Sporting Goods Company gives us a meeting space on their second floor with a 15' x 12' workshop, including drill press, two jigsaws, metal lathe, Handee tool, soldering irons, drills and hand drills, screwdrivers and all the tools necessary to build planes, trains, cars. Rules for cleaning and replacing tools are followed faithfully, and the shop must always be cleaned for the next person's use. Violators forfeit their shop privileges for one month. If the flying field is left a mess after flying, violators must police the area for four Sundays after flying is completed for the day."

Very democratic rules govern the Prop Twisters. Each member gets a constitution and a copy of the by-laws when he joins. These are printed in book form on the club mimeograph machine. A monthly paper is published and sent out to 21 different clubs and hobby shops, from Aberdeen, S.D., to Daytona Beach, Fla.

On the flying side, the Twisters are very active. Every three months there is a club meet and, of course, there are those regular informal sessions on Sundays. An all-stunt contest was held January 22. If the receiver wins the perpetual club trophy three times he may keep it. There is a Sportsmanship

award and a 28-inch-high trophy for the High Point winners. Regular class trophies go to first- and second-place winners, with merchandise for the third, fourth, and fifth. And there you have it, men, the way a successful club works and plays.

Speaking of clubs, Harry Brown, treasurer of the Aeromodelers, Bristol, Pa., tells us that, under the leadership of president Gordon Pearson, members entered fifteen meets last year, taking 16 firsts, 18 seconds, 17 thirds, and 2 fourths. The total of 53 places made the Aeromodelers the club to beat in Eastern Pennsylvania. Sponsored by the Exchange Club, Bristol, the fellows have their own U-control site. Exchange donated the field as well as the machinery to keep it in first-rate condition. One effective promotion idea for both the club and the hobby was a series of off-season demonstrations before Scout groups. In time the Aeromodelers hope to visit a few orphanages. Mention of Exchange reminds us that Harry Copeland, the gentleman with the statistics on beginners a few issues ago, has been appointed chairman of the aviation study panel of the National Exchange Club committee on education.

Bill Robinson, ABC Model Club, Louisville, who go in for proxy flying of their models in foreign contests, says we should not have made him club president a couple of months back. "Best I ever did was five votes," says Robinson. Okay, Bill, you are demoted.

"Much discussion also has gone on here in the Northwest about the beginner's question," reports Earl Cayton, "especially the matter of father doing everything and then letting junior walk away with the prizes. We know the AMA works well on the honor system but, in this case, the AMA has the honor and father and junior have the system."

Now, before we hear out Earl on this familiar problem, we ought to realize that there are very few—and we haven't seen any ourselves—dishonest, or intentionally foxy, father and son teams. It's the system and the rules we make that breed the abuse and every event has its own special form of abuse. No matter what you design or what event you fly in, your first consideration is the interpretation of the rules. If there is abuse, we should perfect the rules, plug the loop holes. It is plenty unfair to the many father-son combinations to make them all suspect. And don't think some of them haven't told us so! Including mamma too!

Well, Earl Cayton is a realistic guy. Like all of us he is strong for the father-son deal for the good of the sport. He feels they should enter as a team, flying in the age class of the oldest contestant, rather than entering under Junior's name and taking the hardware from the other young fellows who do their own building, thinking and flying, frequently on their own hard-earned dough. If Junior builds and flies his own stuff with father as a helper—swell; but where do you draw the line?

"The only salvation would be to toss out the now obsolete Junior, Senior, Open divisions and adopt Novice, Advanced, and Expert divisions as used by many of the California clubs," reasons Cayton. "In this manner a modeler is classed by his skill, no matter what his age. With this setup, Junior would fly in the division fitted to the

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MODEL AIRPLANE NEWS

Serving Aviation 21 Years

APRIL 1950

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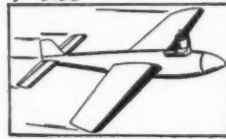


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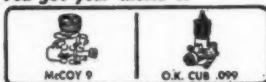
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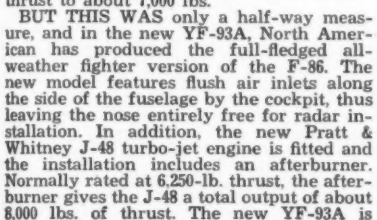
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		Jupiter		1.00	Major	1.00	1905 T Ford	2.50
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REPORT FROM THE WEST

by Lew Mahieu

THE month of January was rather wet in California; we hate to admit it, but we received more than our share of rain. Record trials for attempts at AMA U-control speed and free flight records were held each Sunday during January that the Weather Man permitted. After we tell you what happened at these trials, we will give out with news and chatter received in letters from prominent modelers.

The speed trials were held at the Long Beach Municipal Airport. January first was too cool and windy for any flying, so everyone waited until the following Sunday and came out in the clear warm weather. Frank Cummings did the honors as contest director, and caused a big laugh every time someone started unrolling their lines. Frank's micrometer was about 2" long and almost too small to "mike" the huge cables we have to fly on this year. There were several records set under the new rules, but only two are worth mentioning. Charles Schuette's *Dooling .29* job clocked 130 for a new record in Class B Open with .012" lines. Dick Rigney's *McCoy .29* managed to drag those heavy lines around at 135 mph for a Senior B record. Dick has recovered from his operation as you may have surmised by his fast flying, and has big plans for attending the Mirror Flying Fair meet in June this year. We hope you get there, Rigney.

Yours truly had his Class D job wind up the lines—those .016" lines were just too much for it. Mel Weaver had two *McCoy*



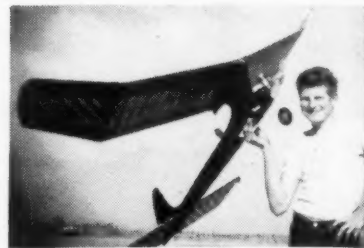
Bob James with a *Civvy Boy* at Fontana; power is K & B Torp

.60 jobs ready for the record runs—one of them sporting an oxygen tank. Most of the speed fliers in our locality, including Mel himself, would like to see the use of oxygen outlawed, but until that time Mel says he will use it. And by the way—he has had some very successful results with oxygen.

Howard Brown and Don Nash were there with their fine bunch of speed jobs. Guess who showed up to try for a Class C Senior record? Bob Beherns! Bob has been inactive as a modeler for some time. He had a lot of fun and made a few flights, but nothing sensational. About a month ago we saw Bob and Rodney Larson having a big time in the snow at Snow Valley near Lake Arrowhead, and at that time he was about to retire from modeling; however, he must have been bitten again. Bob Beherns, Howard Brown, and Don Nash are all building themselves a new set of speed jobs.

Bill Wisniewski and his trusty helper (his cute little wife) were out clocking in a few runs on Bill's Class D job at better than 140. His new ship is really rugged; the bottom half is magnesium and the rest of the ship is wood; it is painted a passionate pink. (as the gals say when they view its bright color). Bob Lauderdale and Bob Miller were on hand with some new planes and ideas to try out. Also seen at the record trials was our old friend Johnny Davis (former West Coast reporter for M.A.N.). Johnny is in the Air Reserves and is flying from the Long Beach Airport on week ends.

The free flight record trials were held at Western and Rosecrans where the mud and goo was "only" 4" deep. Two Sundays of the month of January were okay for trials,



Tommy Moffitt with his *Triumph 49* powered ship of San Dee Mar design

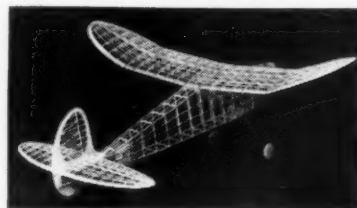
and several good times were turned in. Records were set in hand-launch glider by Ray Acord and Russ Snyder with Ray's design, the *Monster*, which appeared in the January, 1950, issue of M.A.N.

Word from Jim Saftig is that the San Diego Aeroneers are planning to hold their big free flight meet April 30. We sure don't want to miss it because the Aeroneers really put a lot of work into their annual meet, and always have a big collection of trophies and merchandise for the winners.

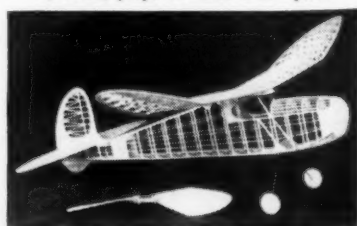
We received a letter from Sam Beasley; Sam was planning to go to a contest in Ft. Worth, January 1, to fly his new *Dooling .29* ship, but he made the mistake of test-flying on .008" lines! Sam and Frank Stone got two good flights on it before it broke loose. The best time was 142 mph. Build another one, Sam, fly it on .012" and she won't get away. All the speed merchants in Dallas will probably be ready and waiting for the "Nats" this year with the annual classic to be held in that City. Sam tells us that the wheels are already turning for the big 1950 meet, and with the help of Johnny Clemens it will be a good one. Sam invited us to be his and Stone's guest while attending the Nationals—that is, if we don't bring along any fast airplanes, Sam says!

Former West Coast modeler Bob Randolph, strictly a free flight man, has done quite well for himself in contests. At the present time his home is in Columbus, Ohio, where the government is sending him to Ohio State to study electronics. He is still on active duty in the AF but his present assignment is a 2 1/2-year course in electronics, which he has been trying to swing for two years. His week ends are spent driving to Wright Field sixty miles away, where he has to get his flying in with C-45's and B-25's. He is planning to get some free flight ships ready for the contest season there. It is a slow process with so much homework, though he has already finished

(Turn to page 43)



Really beautiful design and construction is seen in this Wakefield by Jim Amis. Span 38", area 206 sq. in., wt. 8 1/4 oz., prop. 14" dia. x 26" pitch



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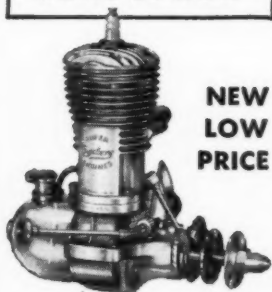
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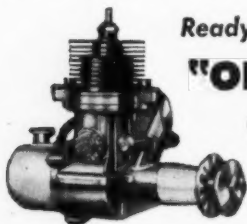
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Scrap Box

(Continued from page 1)

skill of the old man. There can be no complaint and everybody would be happy.

"The only trouble," continues Cayton, "is the setup having to do with records of modelers' classifications. This isn't too difficult on the local level. Keeping track of these records on a national scale might be too much for AMA's meagre staff. Maybe some smart modeler will figure this out for us. But the only fair classification is by skill and not by age."

With these arguments whistling about like spent bullets in a hoss opory we can't get a word in edgewise. Here comes another blast. This one is about contest directors and, in case you don't know it, there's been a battle going on for the past year. We have before us a communication that was sent out by Ed Lidgard to all members of the contest board.

"There has been considerable discussion as to who should be a contest director. Many CD's are too easily impressed by the glib-tongued contestants interested in spot changes for their own advantage. Since there is no handbook for CD's and since free rein is taken with the phrase 'at the discretion of the contest director,' many infractions occur."

"These include," Ed continued, "delayed starting of contests; changes in closing time, tardy awarding of prizes (at one contest prizes were awarded at 11:00 p.m.), changes in take-off requirements during the course of the day or changes on the second day of a large meet, changes in engine run during the course of the day or on the second day of a large meet, dropping or adding events at the last minute." And what is suggested?

"It is proposed," said Lidgard, "that a CD be required to publish before a meeting the exact conditions under which the contest will be held and that, after this information is in the hands of interested parties, he is honor bound not to make changes. If changes are made to the point that the meet suffers hardships, the contestants by petition can have the contest director removed from his capacity."

"Most contestants," Ed goes on, "would prefer to know what kind of a contest is going to be held and then stick to it despite inclemencies of weather. Things which cause contestants most unhappiness occur as a result of last-minute changes. European meets are run strictly in this respect and as a result operate smoothly with a spirit of sportsmanship that makes ours look second-rate."

As a matter of fact, why don't contests start on time? Scheduled for nine o'clock they get organized at 10:30 or eleven. At five, everybody who has an airplane left screams his head off. Or they then jam up and events are combined or flights reduced. What Ed says about changes is quite true. But some of these can be tough, like the hand count at the Nationals this year when weather ruined free flight. Come to think of it, they wisely did fly in the rain rather than postpone the event to another day.

Having been abroad as a member of the 1949 Wakefield team, Ed offers some worthwhile comments on selecting future teams. The Wakefield Eliminations should not be included with the National meet, he believes.

"It would become mandatory for a person to attend the National meet in order to qualify, thereby reducing the number of persons able to compete for a place on the team. Should a person then place, he would have used up all or a major part of available vacation time. Also, it would be a shame to take such an event and subjugate it to a minor role at a big meet like the Nationals."

"It is perfectly possible to run two eliminations in one year—one early in the year for this year's team and a second elimination later in the season for next year's team. Most important is the laying of plans early enough to find sponsors." With that, we agree.

Carl Stokes, of Seattle, thinks the Northwest is left out of the news. There was a

time when the Californians said the same thing. Now the Northwest has made some sensational gains in national prestige and is feeling its oats. Relax, Carl!

"Mr. Art Watkins did the modelers a wonderful favor," says Carl, "when he got use of the National Guard Armory for indoor flying. Have used it four times so far and Hugh Entrop, builder of the monster, has done 10 min. despite a 40' ceiling, cluttered up with rafters.

"Around our section of the city we all are building Wakefields and the best job to date is a new design by Chuck Wood. He uses a high aspect wing of the Lanzo type with a box fuselage with blisters top and bottom for cross section. He also uses a fuse pop-up tail and a fuse-operated retractable landing gear (aha, that's a new one!). He employs the NACA 4612 airfoil. On its second day (40') it racked up what would be winning Wakefield time, with a best flight of 5:13 on a 45-second motor run.

"Both Chuck and I would like to go flying with Warring, or any other person, who claims times over four minutes in dead air! We have averaged about 3:38 in foggy weather so challenge those so-called over four-minute averages." Stokes would like to organize a letter-to-letter contest on this basis, where, presumably, times would be recorded by mail.

Will a Wakefield do four minutes? Our guess is yes. Warring doesn't claim four minutes. Let's be exact. He said 4:45. The ship stated capable of these times was the end product of many airplanes which resulted in the "streamlined slabsider" concept. He uses tapered wings, a fuselage that is faired into a spinner at the nose, fixed gear, and a free-wheeling propeller. Off hand, it would seem possible to boost that 4:45, but Warring maintains that folders, etc., mess up the trim. Perhaps he has something, for extreme duration would require a hair splitting trim. On the whole, like a few other foreign airplanes, Warring's Wakefield probably is lighter and certainly has a far greater motor run on relatively less power. Our Wakefields are from 10 to 20% overweight. Given a 50% increase in motor run it is possible that the British machine gets higher, despite our burst-of-power preference and, consequently, would glide longer. American designs go in for high, fast climb to hook a thermal. We use more power and lower pitch. This is perfectly okay and, in fact, may be the better approach on an average, but it does not produce the maximum duration airplane which is what the shooting is about. It may be that such an airplane would be blown over the horizon before it could get high enough, at some of our contests. Just to get the ball really rolling, it would not surprise us if there are better gas models in the world than the typical American pylon. Better from a maximum duration standpoint in dead air, that is; given our hot American motors to get them up, and given an equality of wing loading due to rules, our designs tend to stay put, once a winning combination is found, and everyone resists change, frequently kidding the shirt off the guy who would try something different.

Not so tall, but very true, is this story of how the British National Stunt Championship was won because of a letter printed two years ago in the "pen pals" column.

"Through your columns, I have kept in touch with the nicest crowd of fellows in the world," says Brian Hewitt, Birmingham, England. "Sometimes we fixed up swaps of various articles and I have felt guilty because, to me, the balance of the swap was in my favor. Sometimes I felt guilty of taking advice and of learning the tricks of the trade when I was unable to give anything in return. Always I have been laughed at for even mentioning these things."

Hewitt had been interested in control line stunt and was just a beginner when this was mentioned in MODEL AIRPLANE NEWS. He could remember having read about such things as stunt tanks and symmetrical sections and had never even imagined such things as vertical eights. He was very busy flying and crashing (trying to fly upside

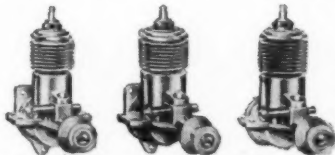
(Turn to page 62)

A LINE OF LEADERS!

OK

- A Snap to Start
- Easy to Operate
- Record Breaking Performance
- Every One the Value Champ in Its Class

1950 CLASS "HALF-A" AND "A" LEADERS



"OK" Cubs—for indoor flying, sports flying and free flight—it's the .049 It's the .074 for stunting and speed flying. The high-output .099 is the new value leader in the "A" class. Any model complete with glow \$5.95
plug less tank.....

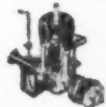
Special Combination Package—any "OK" Cub engine plus propeller, wedge type gasoline tank and neoprene tubing.....\$6.75



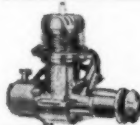
1950 CLASS "A" SPECIAL

"OK" Bantam Glow Plug Model—A better-than-ever edition of the famed record breaker. Designed by noted engine designer Ben Sheresaw. Weighs 3 1/4 oz. with range from 2,500 to 11,500 rpm. Complete with \$7.95
glow plug, less tank.....

Spark Plug Model—Complete with plug and tank.....\$9.95

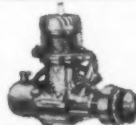


1950 CLASS "B" LEADERS



"OK" Hot Head Glow Plug Model—New features include ebonized cylinders, gold anodized high-compression cylinder. Complete with \$9.95
glow plug and tank.....

"OK" Super 29 Spark Plug Model—Complete with aluminum tank and spark plug\$11.95



1950 CLASS "B" BARGAIN OF THE YEAR

"OK" Mohawk Chief Glow Plug Model—A high quality precision engine in the low price field. Superbly engineered—features high grade metals and alloys. Black tested with full 60-day guarantee. Complete with \$8.50
glow plug and tank.....

Spark Plug Model, with plug and tank.....\$9.50



1950 CLASS "D" LEADERS

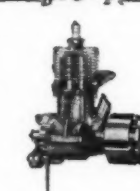
"OK" Super 60 Glow Plug Model—With new ebonized cylinder, gold anodized cylinder head, aluminum crankcase, large ball-bearing. \$9.95
Complete with glow plug and tank.....

Spark Plug Model, with tank and plug.....\$11.95



1950 "OK" CO2 IGNITIONLESS

A cinch to mount. Complete—ready to run—without plug, coil, condenser, battery, booster, wiring, timer or needle valve to worry about. Simple, safe, it runs on compressed carbon dioxide. Weighs only 3/4 oz.—up to \$4.95
7,000 rpm.....



"OK" Super 60 Marine Glow Plug Model—Basically the same great engine as the "OK" Super 60—but with fly-wheel for use in miniature racing boats and cars. Complete with glow plug and tank.....\$12.95

Spark Plug Model—Complete with plug and tank.....\$14.95

Mighty "OK" Twin—For large models and radio controlled ships. Weighs 23 oz. with tank, up to 6,000 rpm. Complete with spark plugs and tank.....\$49.00



COILS

"OK" Coil—fast spark, low battery drain—for "A" to "D" class. Complete with lead.....\$1.50

"OK" Twin Coil—for all makes of two cylinder engines. Complete with leads and matched condenser\$3.50



Sensational "OK" Glow Plugs—Result of 20,000 block tests. Tests proved it better three ways—more guts—better speed range—longer life. Two types, 49¢
short or long, each only.....

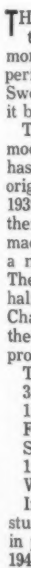
See Your Dealer TODAY or Write Us Direct:

Engines and complete parts service at your dealer's. See him today, or write direct for catalog to:

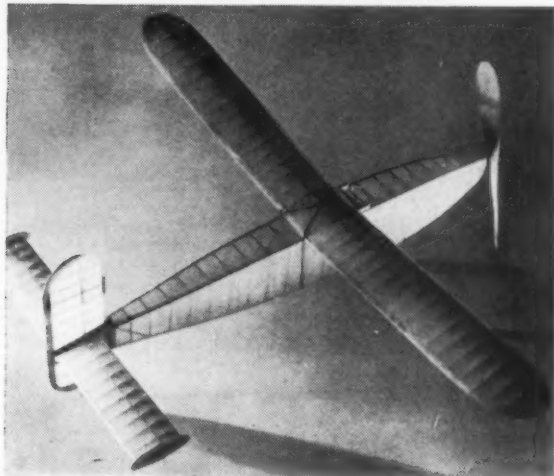
HERKIMER

TOOL & MODEL WORKS INC.

204 Harter St., Herkimer, N.Y.



WAKEFIELD WINNER



The success of this model confirms the idea that the successful contest flier must really know his plane

by AARNE ELLILA

THIS Wakefield model was originally built in July, 1939, so that when it won the Wakefield Cup in 1949, it was a little more than ten years old. It was designed on the basis of experience which I gained in the Scandinavian Contest, held in Sweden, June, 1939. Some modelers have asked me, "How has it been possible for the plane to survive for such a long time?"

The Wakefield Winner has by no means been a "cabinet model." On the contrary, it has flown countless hours and has been repaired and partly rebuilt many times. In its original form it took part in a few contests held the summer of 1939, and was at that time able to fly 2½ min. without a thermal. The following winter considerable alterations were made in its construction. The fin and stabilizer were rebuilt, a new propeller was made, and the covering was replaced. The flight results immediately improved by an average of a half minute. I very carefully prepared for the Scandinavian Championship Contest, 1941, altering the stabilizer again, and the model took on its present appearance. The alterations proved successful, for the flight results increased to 3' 20".

The contest record of the model follows:

3rd place in an International Contest in 1939

1st place the same summer in Lithuania

Finnish Championship Winner in 1940, '42, '43, '44, and '46

Scandinavian Championship (unofficial), 1941

1st place in an International Contest in Sweden, 1945

Wakefield Cup, 1949.

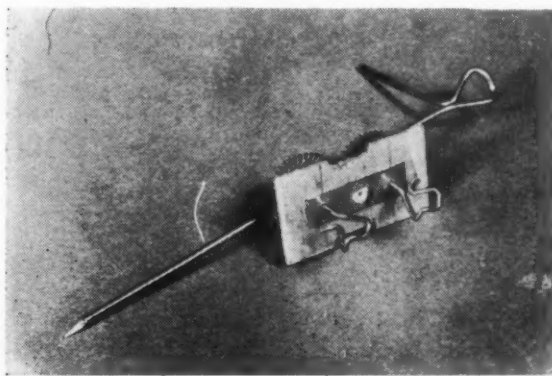
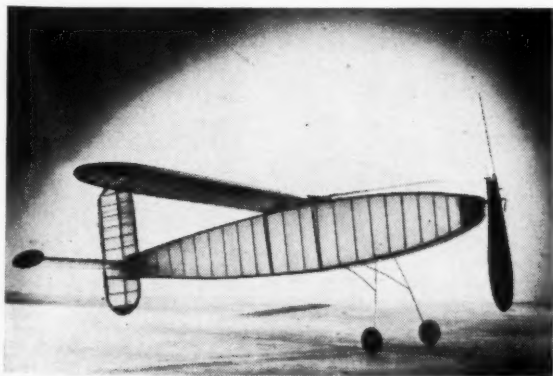
In 1947 the model crashed seriously and because of my studies, I had no opportunity to repair it. Thus the ship was in poor condition until I began to prepare it last June, for the 1949 Wakefield Contest. I had only two weeks for this job

since I had to leave for England July first. There was just time enough to test and trim the ship only twice before leaving home. I couldn't, however, do this with full power. Under the circumstances, I was compelled to pack an inadequately tested model for England. Before the competition, I bought some new rubber in London, because the motor I had with me was as old as the ship itself. The quality of the rubber which I bought is, in my opinion, superior to the prewar standard. However, the dimensions of the rubber differed somewhat from the kind that was available before the war, and this, too, caused some difficulties in preparing the model for the contest. In fact, after the repairs, I never had a chance to test the model with full power, before I was to take off for the first official Wakefield flight. However, I had one big advantage over my competitors! During the previous ten years I had become fully acquainted with my model, and I think this was the most essential reason for my success and the one that made it possible.

Owing to insufficient testing, and not because of the poor weather, the first flight was a near catastrophe. After every flight, I was compelled to make minor repairs to the model without being able to test it in the meantime, owing to the poor weather. The last flight, however, was very satisfactory.

The fact that I won the contest surprised me at least as much as it did my fellow competitors, and I can assure you that I slept very well the night before the meet (read Bob Hanford: "Wakefield Impressions," MODEL AIRPLANE NEWS, November, 1949, page 50).

The 1949 Wakefield Winner was designed with attention to (Turn to page 49)





Paul Aiken of Postal Service helps Dennis Davis load first official air mail ever carried by a model



Dallas Sherman, who dreamed up PAA-Load

THE PAA-LOAD EVENT

by GEORGE GARDNER

AS DENNIS DAVIS made ready to fly the first model aircraft air mail in his PAA-Load Event entry at the Olathe Nationals last summer, he was the calmest man on the field, and the sponsor's representative, (yours truly), was the most jittery.

It was a time when any one of a dozen things could easily go wrong. Any modeler knows only too well what could have happened. Maybe the engine wouldn't start. Maybe the model might ground loop. Maybe it might take off, and then dive into the ground. Maybe it might take off, start off across country and disappear over the horizon. Anything could happen!

The moment was fraught with high significance to payload flying and PAA-Load Event. Second Assistant Postmaster General Paul Aiken was on hand to lend official authenticity to the mail flight feature. Veteran model builders and leaders were standing by, sizing up this innovation in model flying, and equally ready to call it good, or the opposite. As for Denny Davis—he was cheerfully going out on a limb.

This special mail flight was not a part of the official PAA-Load competition, which was to come later. The tiny first flight covers were to be borne aloft in his model, then delivered to Olathe Postmaster Jack Hawks for dispatch to government officials, model airplane fans and philatelic collectors. Davis had agreed to make this first mail flight with the same model he had groomed especially for the PAA-Load Event, starting later in the day. A pioneer in PAA-Load flying, Davis was a first-place winner at the San Diego contest earlier in the year. Naturally, he hoped to top that triumph with a first in the Nationals. He had his model tuned to perfection and was confident that it would turn in a good performance. If he had

the misfortune to wash out his airplane now, he just wouldn't be in the contest later.

Nevertheless, he hadn't even hesitated when he was asked to make the initial mail flight in advance of the official competition because scheduling of events made it necessary to proceed that way.

As has been said, Denny was perfectly calm. After receiving the packet of first flight covers from Mr. Aiken, posing for pictures and replying to reporters' questions, he loaded the covers into the payload compartment of his model, put the airplane in place on the runway, and spun the prop. The engine started immediately. He made his final check on wind direction, adjusted the plane accordingly, and let go. The model took off, turned its nose up in a steep power climb, leveled off and circled.

Four minutes and ten seconds later it landed no more than a hundred yards away from the starting point—a perfect flight for this purpose, because it was possible to retrieve the bundle of envelopes for immediate delivery to Postmaster Hawks, with appropriate ceremony and taking of pictures.

It would be pleasant to be able to report that Denny went on to win top honors in PAA-Load Event itself afterward. He didn't. But he did capture second place in Class B Open with 2,003 secs. for three flights, which was the second best time for PAA-Load Event at the 1949 National in a field of more than eighty entrants. It was just too bad for Denny that the best time—2,141 secs. by Carl Rambo—was also flown in Class B Open.

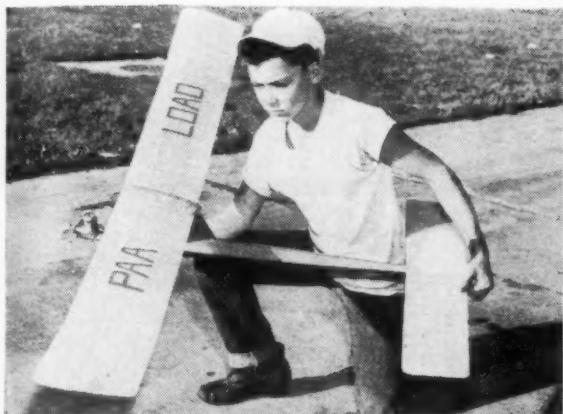
As for the sponsor's representative, Denny Davis's superb flight with the first model air mail was far and away the best relief for nervous tension yet devised. He, the sponsor's representative, that is, was heard to mutter, "It worked better than I had any right to expect."



Sherman ran a control line PAA-Load in Tokyo—no space for free flight!



A few of the PAA fliers line up at the 1949 Nationals in Olathe



Ronnie Grist's Class B model is required to carry a load of 16 oz.

One of the few contest events requiring characteristics similar to those of big planes, PAA-Load is gaining in popularity

Although not a part of the official competition, the mail flight by Denny Davis, and additional mail flights made later in the day by other contestants after they had completed their official flights, were important to payload flying because they provided a clear and colorful illustration of the purpose of PAA-Load Event.

A restatement of that purpose should be appropriate at this point, and our thanks to Editor Howard McEntee, of *MODEL AIRPLANE NEWS*, for providing an opportunity for the sponsor's representative to make it.

Many readers will recall that a payload event for free flight R.O.G. gas models was first suggested by Dallas Sherman, Pan American World Airways executive then stationed in Washington, D.C.,—now in Tokyo. As a modeler of more than twenty years' experience (and the only one ever to design a model airplane especially for a ventriloquist's dummy, said dummy being Charlie McCarthy), Col. Sherman thought there was a place in model flying for an event which would more closely simulate the work-a-day flying of full scale airplanes.

Conversations with aeronautical engineers and pilots confirmed his conviction that the airplane's mission can be expressed somewhat as follows: the airplane has to take something aboard that requires transportation somewhere else, take-off, make the journey, arrive at the destination, and deliver its load. In other words—it has to carry payload.

This definition will hold up in any type of commercial, military or private flying. The transport airplane operates for the express purpose of taking passengers, mail and cargo from one place to another. The military plane does the same for bombs, personnel, or other military load. The private plane transports its owner and his guests from one place to another, or carries groceries to his farm etc., etc.

How does this apply to model flying? First of all, do we



Long Island modelers labor over load-carrying ships at Nationals

have a category with which modelers already are familiar, and which will lend itself to further development along the lines suggested by the above? We don't want to face the builders with any more new problems in design, construction and flying than are absolutely necessary to achieve the basic objective.

Yes, there is such a category. Free flight R.O.G. gas-powered models meet the requirements of taking off under their own power—like full scale airplanes—flying through the air and landing somewhere else. Add payload, and you have the full comparison.

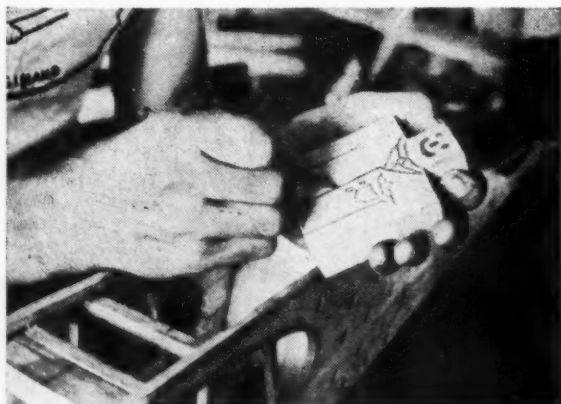
Other categories also will qualify: radio control and rise-off-water would be suitable. So would rubber band, CO₂ and jet, if they rise off ground or water. But we'd better take one step at a time. Let's start with free flight R.O.G. gas models, which are popular, well understood, and meet the requirements for comparison with full scale flying as well or better than any other. Maybe later on we can extend the idea to radio control and other types of competition.

That was the line of thinking which led to the development of the original rules and specifications for payload flying in the PAA-Load Event, and the first competition under these rules was a part of the Nationals of 1948, at the U. S. Naval Air Station, Olathe, Kansas. The first winner was Herb Kothe of Omaha, Nebr. (it was a one-class contest that first year) and the original design which Kothe brought to Olathe in 1948 was widely copied in 1949 for entries at the Nationals and at local and regional meets throughout the country.

Although the free flight model is the acknowledged basis for this sort of flying, the sponsors recognize that in some localities free flight just isn't possible, and some thought has been given to a PAA-Load contest for controliners. The first experiment along this line was made in Japan; Mr. Sherman wished to sponsor his favorite contest at a Tokyo Meet, but free flight was out of the questions, so he improvised a controline event. He is shown with some of the entrants in one of our illustrations.

The rules vary in only a few respects from the standard rules and regulations established by the Academy of Model Aeronautics for free flight gas models. All applicable AMA

(Turn to page 44)



Rules specify size and shape for plane "occupants"; they weigh 8 oz.



Robert Dunham also "carried the mail" at Olathe; here he fits it in

What About PROFESSIONALISM?

pro-fes'sion-al-ism ... Model Flying. One who competes against amateur model builders while actively engaged in the manufacture or sales of the specific type model or engine in competition.

CONDUCTED BY
JACK BAYHA

LAST MONTH we gave the advocates of professionalism a chance to say their bit for the professional model contest entry. This month we are giving those opposed an opportunity to speak; these outstanding men in the hobby world are displaying great courage in coming out against the professional model builders, who, in some cases, are close personal friends and business associates. Last month you heard the defense; now hear the voices raised in protest.

Opposed to professionalism:

Dr. Walter Good—Outstanding radio scientist and prominent radio control expert.

William Effinger—An industry member and famed modeler.

W. S. Hinman Jr.—Aircraft radio pioneering scientist and outstanding advocate of model aviation for youth.

Walt Schroder—Famous model author and designer.

Maurice Schoenbrun—Veteran National's winner, model expert, author and designer.

Anonymous—Prominent booster of model aviation and veteran builder.

Naturally, all of our contributors this month do not have the same opinions as the professional, nor do they advocate the same solution to the problem. They have their own personal opinions and express them. In some cases, we have been compelled to abridge their comments so that all may have an opportunity to speak.

Dr. Walter Good is well known as the nation's top expert in radio control. Not too many of you know that he was an outstanding radio physicist during the last war, and a large contributor to one of the war's most important weapons—the VT or Proximity Fuze. Walt is a veteran in the hobby field, and he continues to do all he can to help the younger builder. If radio control licensing restrictions are ever relaxed, it will be largely due to the constant work being done by Walt Good.

Says Dr. Good, "The chief difficulty of the professional problem is one of definition. Who is a professional?"

"My definition of the professional is probably different from many other equally good definitions, but at least it helps limit the field. I say a professional (although I'd rather call him a 'hotshot') is a modeler whose appearance as a prize-winning competitor in a particular event is more harmful than helpful to the model aviation hobby. I realize that even this definition is not easy to interpret, but there are obvious examples as indicated by the complaints. At a recent meet half

of the contestants didn't even attempt to fly because 'Mr. A. Hotshot' was there with a stack of planes, with the inevitable result that Mr. H. cleaned up. Mr. H. thought he was promoting his product by adding up a few more wins. What he didn't realize was the glowing resentment stirred among the would-be fliers. I would judge this example as an entrant whose appearance as a prize-winning competitor was harmful to the cause of model aviation. He alone prevented many less experienced modelers from enjoying competitive flying. I personally feel that an amateur 'Hotshot' could have been just as guilty as the professional one in the foregoing example.

"Let's consider how many 'Hotshots' there are in the country today. In the first place, it takes only one hotshot on one contest to irritate a lot of modelers, and chances are that not every contest has the misfortune of an unthinking 'hotshot.' Of the 600 sanctioned meets each year, maybe 200 'hotshots' participate. That is 200 out of a total of 20,000 AMA members, or about 1%. That's not such a large number.

"About now, one may wonder which side of the fence I'm on. I like to watch a Mr. H. perform because he's really good. He's the one we go to for the word, when we want the best. I used to relish the idea of flying against the 'hotshot' for just the thrill of coming close or beating him. I'm sure others have shared this same thrill. To prevent these 'hotshots' from flying at contests would be like shooting each new tennis champ as he reaches the top. I say let's not shoot Mr. H., let's exploit him.

"Isn't the large objection to 'hotshots' that not only do they win the meet, but they take home the prizes, too? If the professional Mr. H. is really flying to exhibit his product, then I can't see why he wants the prize, can you? Now, in addition, if we can talk him out of listing his name in first place, we would probably have overcome the final objections! However, this is a more delicate job. If this could be done, I can see no possible reason why the 'hotshot' should be prevented from flying.

"You have asked for an opinion, and I realize it's unfair to criticize without suggesting a solution. Because of the small number of 'hotshots' in existence today, I believe they can solve their own problem. Again, who are they? They are, according to my definition, those consistently-winning modelers whose entry does more harm than good, and I am sure many of them are unaware that they are in reality 'hotshots.' Thus, all we have to do is to list the 'hotshots' and hand them their problem. This is easier said than done.

"Therefore, I propose the formation of

a Hotshot Club, and to get into this club you would have to be hot and stay hot in your particular event. You would be invited to join this club only after a thorough examination of your abilities by the current club members. A member would enjoy the following privileges:

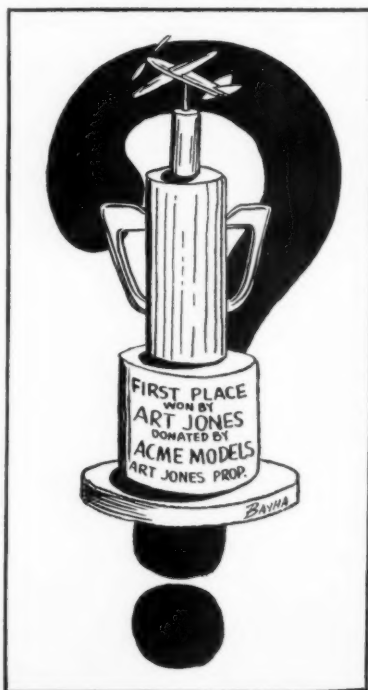
1. Names of 'hotshots' would appear periodically in model publications.
2. A 'hotshot' flies in all events.
3. When flying in his special event he would accept no awards. His name would be listed among the winners, but not attached to a place.
4. If he fares poorly in his special event, he may be allowed to resign and reseek his position as a 'hotshot.'

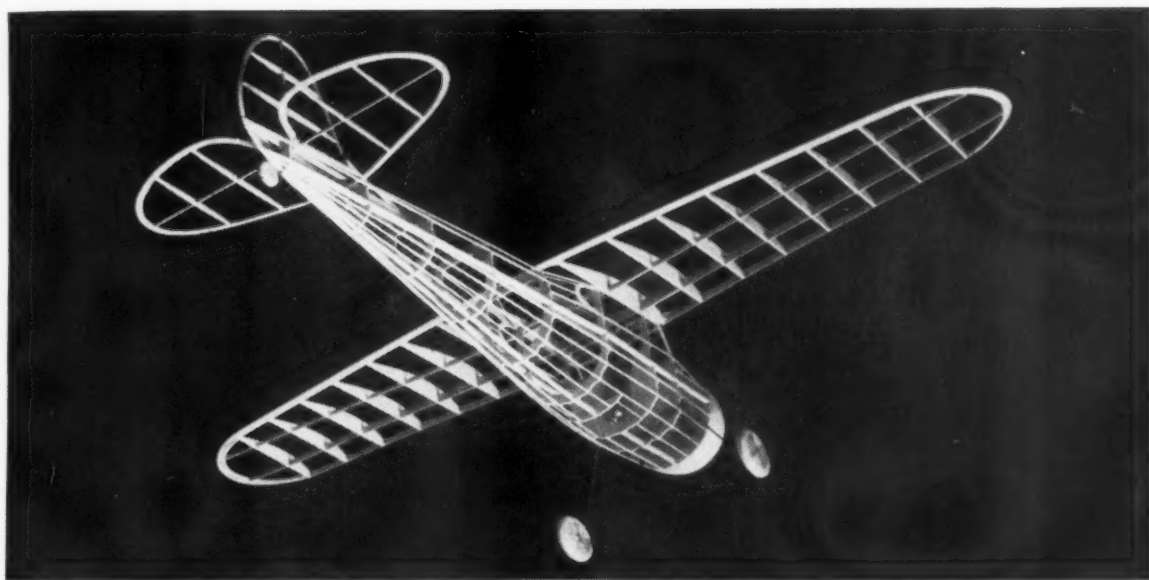
"I am well aware that this is not the whole answer to this problem. But I do say, let Mr. H. fly. If he doesn't know he's a 'hotshot,' tell him. His sense of sportsmanship and his desire to keep the hobby strong will take over from there."

* *

Berkeley Models are known to all. The guiding light of Berkeley is famed modeler Bill Effinger. Bill knows the score (Turn to page 53)

PART TWO





Modeling the Cessna 195

AMONG the widely used executive-type planes is the Cessna 195. Its purchase price of nearly fifteen thousand dollars keeps it from most private plane buyers, consequently many of the 195's are owned by businesses which require the swift, comfortable transportation it provides.

From most every point of view the 195 is a remarkable craft. With a cruising speed of over 165 mph and a luxuriously outfitted cabin, it matches many air liners for speed and comfort. Pilots like the 195, for it flies with the ease and safety of most light training planes. Equally important, is its ability to operate from the smallest airports, thus making it possible to take the ship just about anywhere a plane can safely land and take off.

The Air Force has recognized this ability to fly from restricted areas and has purchased 195's for rugged Alaskan duty. For service of this kind, wheels are interchangeable with skis and floats.

Capturing the attractive appearance and good flying qualities of the prototype, this model will more than compensate for the time and effort required for its construction. An O.K. CO2 expansion-type reciprocating engine was installed in the original model, but the design may easily be altered to utilize rubber strands or a small gas engine for power. In any case, work carefully, using the plans and text as a guide, and your model 195 will surely take to the air as readily as a duck takes to water.

Conventional model construction practices are used throughout. Balsa wood is required for most parts and the various members are fastened together with fast drying, colorless cement.

Many assemblies can best be built right over full size drawings so the first task is to double the magazine-size plans. To do this, step off each dimension twice using dividers. Where

curved parts are shown, one-half inch grid is imposed on the magazine page to speed the job and increase the accuracy.

The fuselage is a simple yet strong structure. Four keels (two side, a top and bottom) are cut to shape from 1/16" balsa sheet and then the 1/16" thick formers and 1/16" sq. stringers are added. All parts are medium grade balsa except the stringers which are hard balsa. Assembly is accomplished most easily if the top and bottom keels are pinned to position over the enlarged drawing; half formers and a side keel are then attached. Once this structure is dry, it is lifted from the jig and the remaining parts attached. Forward of former No. 1, a 1/4" thick bulkhead identical in diameter to former No. 1 and radiused as shown is attached. This member retains both the motor mount and cowl.

The motor mount consists of a 1/16" thick plywood front and 1/8" thick supporting sides. Size of the parts can be determined from the drawings. The motor mount should be cemented securely to the 1/4" thick forward bulkhead.

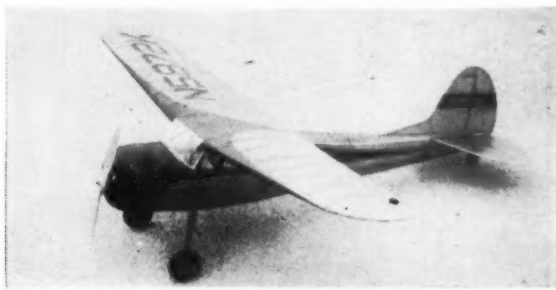
On the original model, the cowl was turned on a lathe from a solid block of balsa. This is not a necessity, however, as a fine cowl can be carved by hand or one can be made by laminating rings of 1/4" thick balsa together.

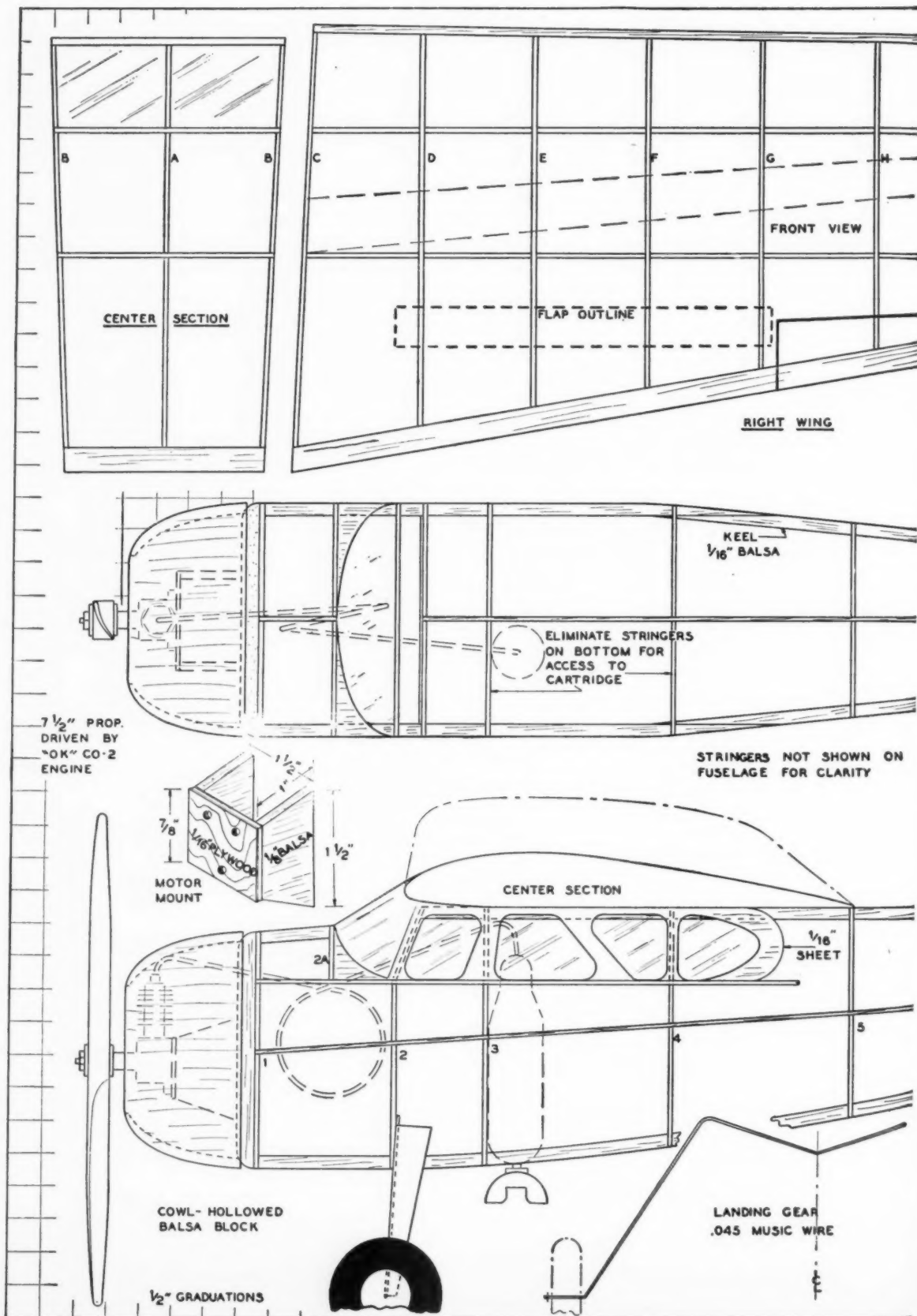
Before the cowl is cemented in place, it would be best to install the O.K. CO2 engine. Bolt the engine to the mount. Then cut a notch in the solid bulkhead to pass the pressure line. The cartridge holder is sewn by needle and thread to former No. 3, off set from the center line, as shown, to by-pass the bottom keel.

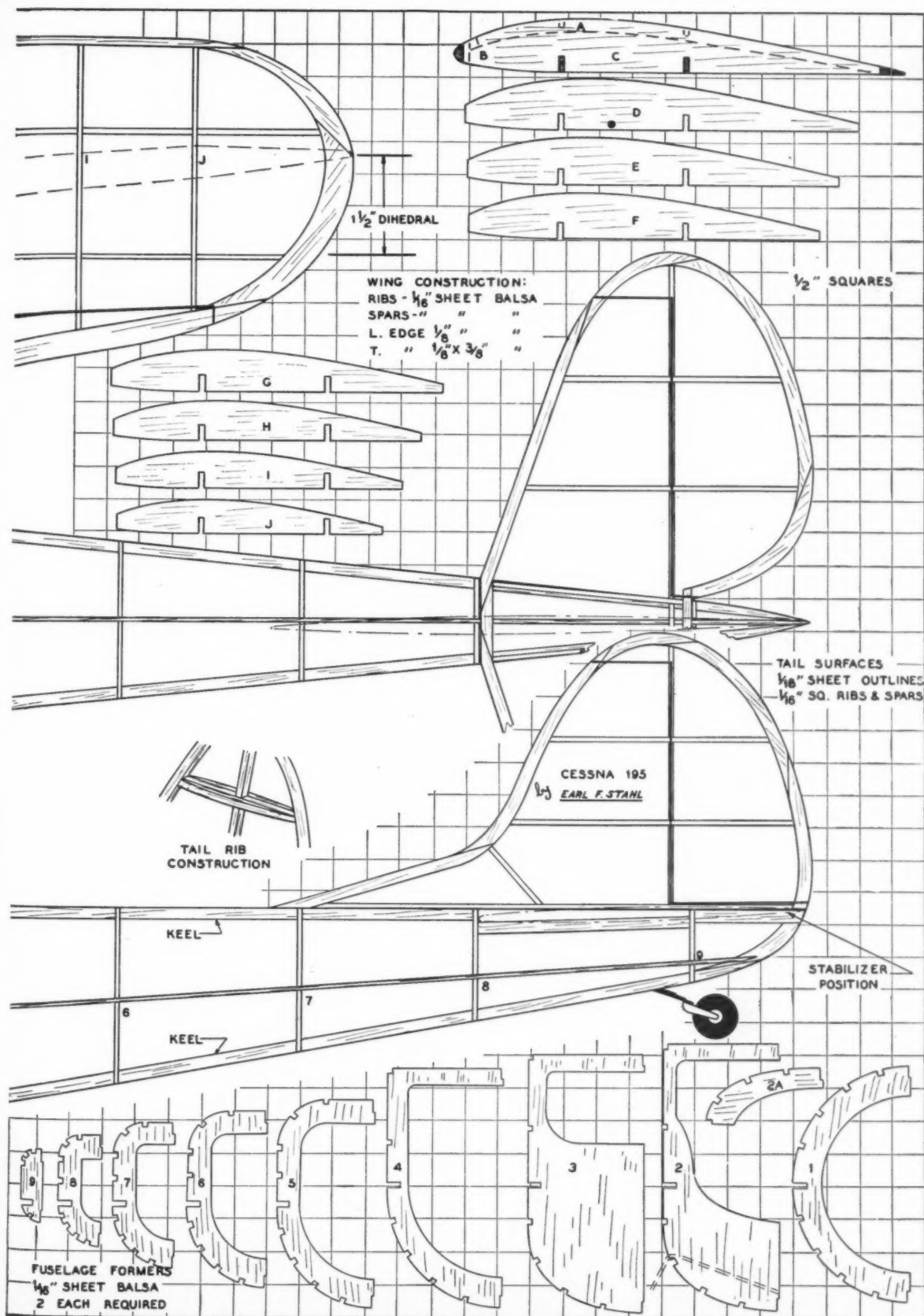
The landing gear is a single piece of .045" music wire sewn to former No. 2. A 1/32" balsa fairing held in place by silk covering over both the wire and balsa adds realism. Wheels are balsa, and they may be

(Turn to page 52)

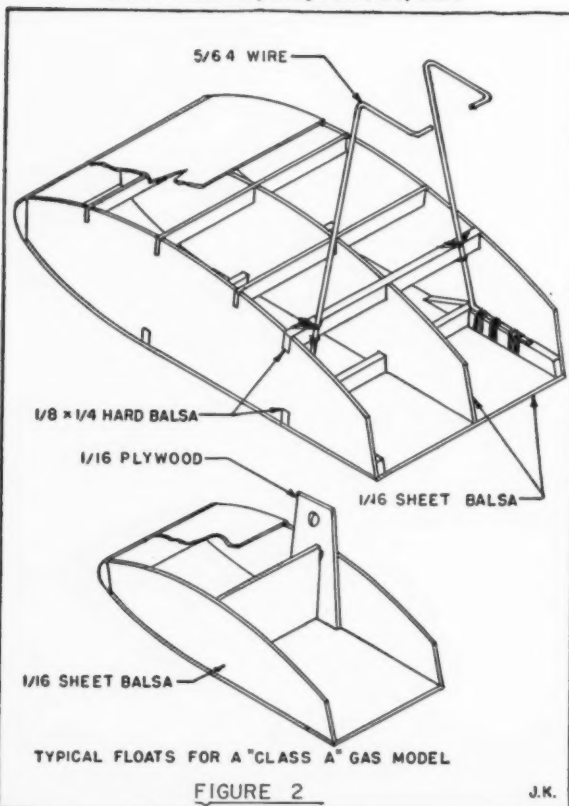
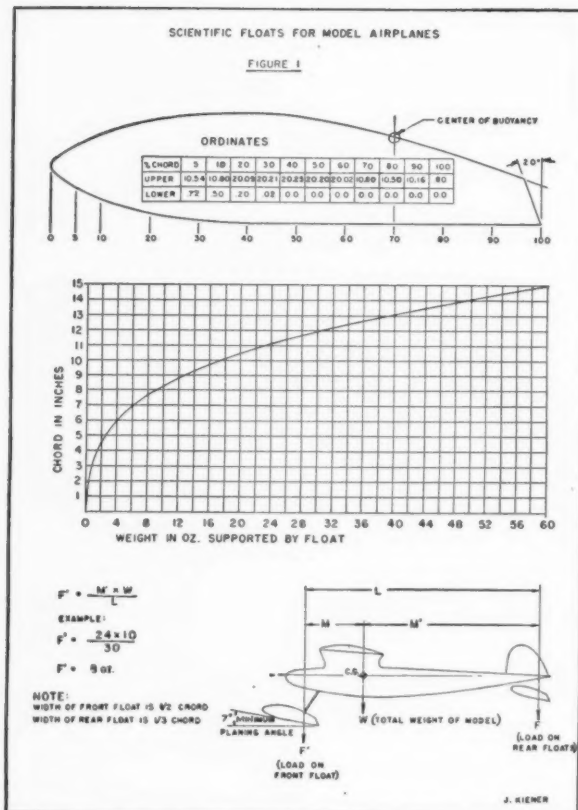
by **EARL STAHL**







SCIENTIFIC FLOAT DESIGN



A SMOOTH-FLYING R.O.W. model is more fun to fly than any other type, but an unsuccessful one is a greater headache than can be imagined. The latter type seems much too prevalent, so let's cast a little light on the subject.

The long, narrow type of pontoon common to full scale aircraft just isn't practical for a model. By the time the model gets up on the step and is ready for a take-off, "ole debil" torque begins to take effect, and a successful take-off is very unlikely. The surface tension of water is the same for models or full scale airplanes. This handicaps the models because the water clings to the float in a smooth film, instead of breaking into droplets, as it does in full scale pontoons.

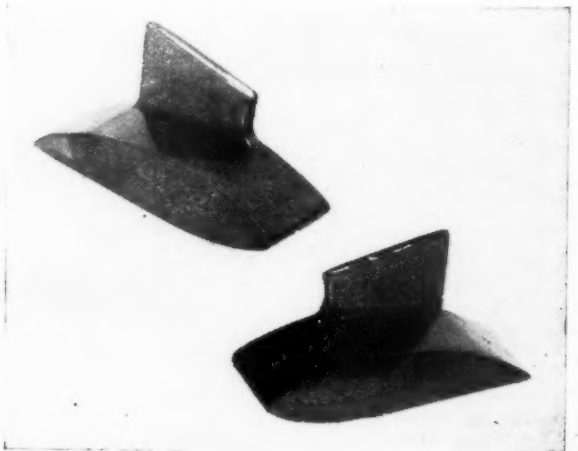
The floats presented here were designed to get the model into the air without a long run. For this reason, the planing surface is broad and flat. Any forward motion tends to force the float to the surface rather than through the water. The most successful ships on the West Coast use one float in front and two smaller ones in the rear. The data presented here will apply to this setup, or may be used equally well for a two-front-float arrangement. Floats of the type described have been used very successfully by Don Donahue, Andy Peterson, and a number of fellow *Thermal Thumbers*.

The data in Fig. 1 will enable you to design a set of floats exactly the right size for your model. Before using the graph, you must find the weight to be supported by the float. To do this, locate the position of both front and rear floats in relation to the center of gravity of your model. The trailing edge of the front float must not be aft of the wing leading edge. The measurements M' and M are taken to the indicated center of buoyancy of the front and rear floats. Now use the simple

formula $F' = \frac{M' \times W}{L}$ to find the load F' on the front float. The

difference between this figure and the total weight W will be the load F on the rear floats. Don't forget to divide this weight by two if two rear floats are used.

On the horizontal line at the bottom of the graph (Fig. 1) find the weight to be supported. Follow the vertical line corresponding to this weight up until it intersects the curved line, and read the required chord on the left hand side of the graph. Use the ordinates given on the data sheet and plot the float section in the same manner as an airfoil. The front float is made one-half as wide as it is long. The width of the rear float is one third of the chord.



Two tail floats, with supports which hold them to stabilizer

Ever have your float job make like a speed boat, or worse yet, like a submarine? Correct floats are easy to make and install, as you'll learn from this article. Try the author's suggestions; then let us know how many R. O. W. trophies you have gathered in

by **JOHN KIENER**

You now have the size and outline of your floats, so let's investigate the structural portion of the job. In Fig. 2 I have shown a sketch of typical construction as used on my floats for a ten-ounce Class A gas model. For larger models, increase the size of the wooden members proportionately. Use very hard balsa for the bottom planking and cover with silk. The balance of the float may be either silk or tissue covered. Dope the floats well, for they must be waterproof. Don't forget to fuelproof the front one if you are using glow plug fuel.

The wire struts that support the front float should be long enough to allow propeller clearance when the model makes a rough landing and deflects the float. Note that the mounting of these floats should be flexible enough to allow such deflection under stress. This will enable your model to take "dry land" landings without mangling your work. A certain amount of flexibility is a help on take-offs, too, providing the struts are fastened to the float at or aft of the center of buoyancy.

Water pressure on the float tends to increase the planing angle and boosts the model out of the water in a very short distance. The proper planing angle varies with each model, but it should be between 7 and 12° (from the fuselage reference line). If your model takes more than 20' or so to get off the water, increase the angle. Under full power my .09 Class A model has a take-off run of about 2'.

The rear floats on my models are fastened to the sub-rudders under the stabilizer tips. A cleaner installation would result if the floats were built into the lower surface of the stabilizer.

I would like to conclude this article with a few choice hints on R.O.W. flying.

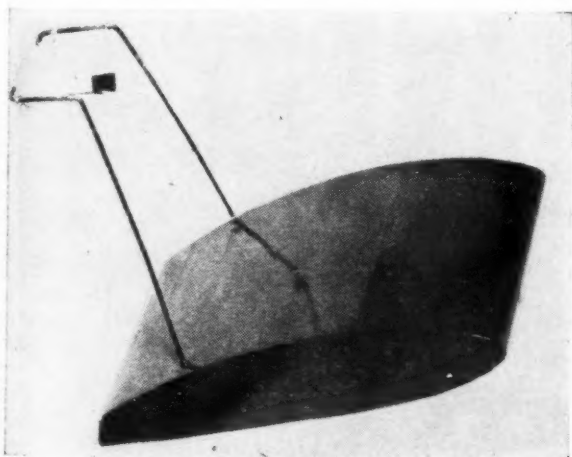
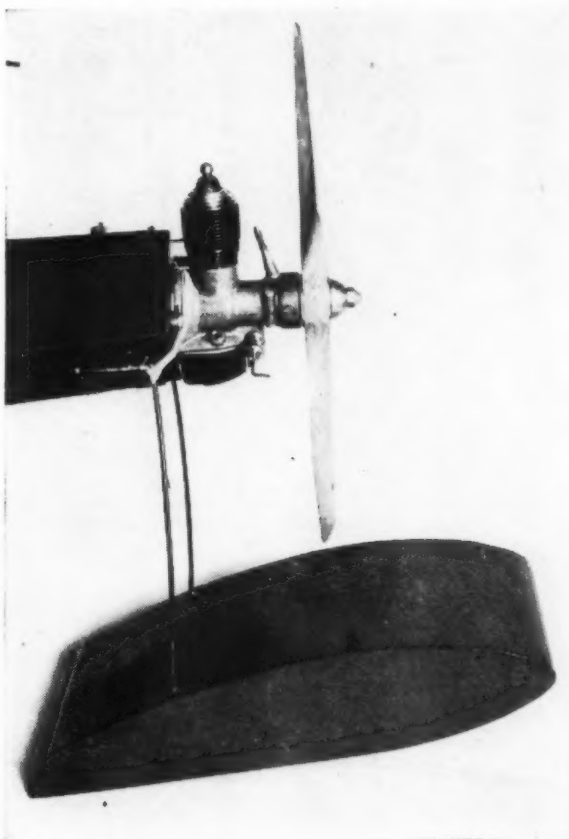
1. Remove your shoes and your pants, too, if you have your bathing suit along. It feels rather silly to find yourself knee deep in mud and water with your shoes on.
2. Launch your model directly into the wind. Check the wind direction before every flight.
3. Don't shove your model! Hold the tail down and just let it go.
4. Check your floats before attempting a flight. A front float that is not aligned with the fuselage acts as a rudder.
5. If your model should get a dunking, check the wings before attempting another flight. A wingtip full of water insures a spin.
6. Use a dethermalizer! R.O.W. models get lost, too.

Any comments or questions on these floats will be appreciated by the author. Write him care of MODEL AIRPLANE NEWS.

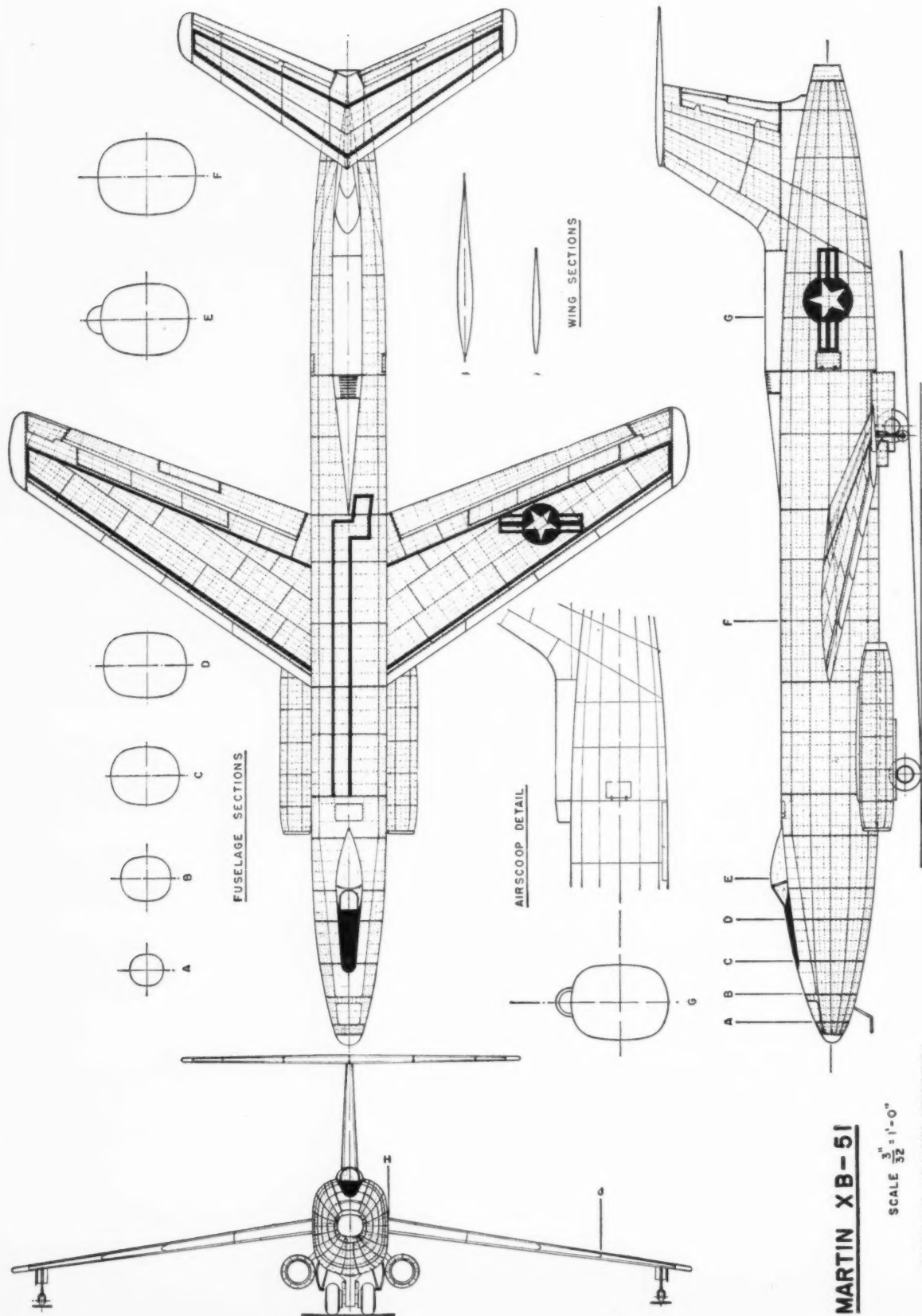


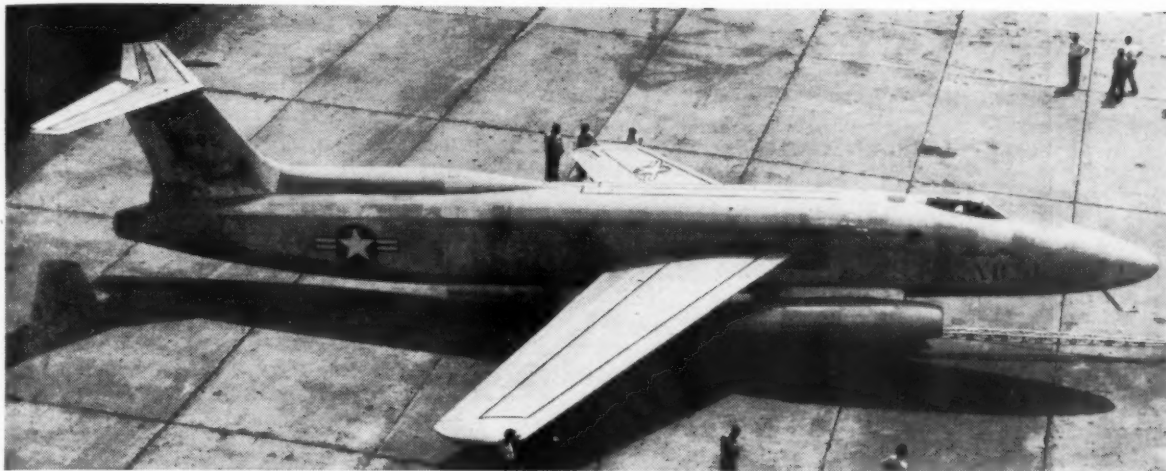
The author with his very successful "A" R.O.W. gassie

Below. Keep that float well forward—works better and protects prop too



The main float can be made quickly detachable if you wish





MARTIN XB-51

by ROBERT McLARREN

COMPLETE revision of the U. S. Air Force aircraft designation system in May, 1948, resulted in elimination of one of the proud and vital categories of combat aircraft types: the attack plane. This action by no means signified the elimination of the attack mission or aircraft designed to execute that mission. It merely provided recognition of the technological revolution in aircraft design and performance that had occurred during the history of the type. Actually the designation "attack" had lost its design significance as early as 1943, when the Air Force changed the specification to read: "bombardment, light."

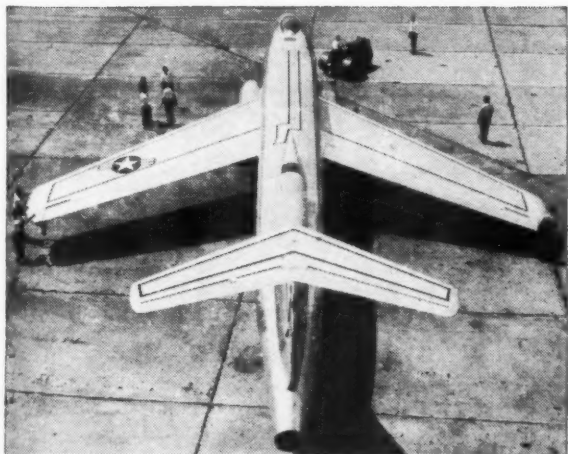
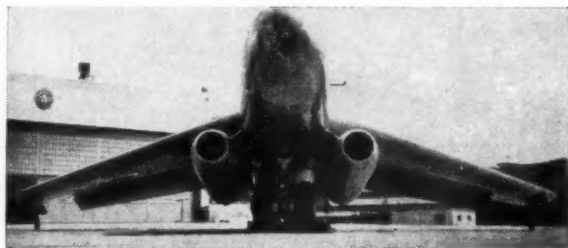
The "A" designation for Army aircraft actually began life in 1923 to signify an "ambulance" airplane and the first airplane to bear the designation was the Cox-Klemin XA-1, a steel tube and fabric biplane which carried a crew of two and arrangements for carrying two litters. This was followed by a special ambulance version of the big Fokker T-2 transport (used in the famed Kelly-MacReady first non-stop coast-to-coast flight), designated the A-2 and also designed to carry a crew of two plus two litters.

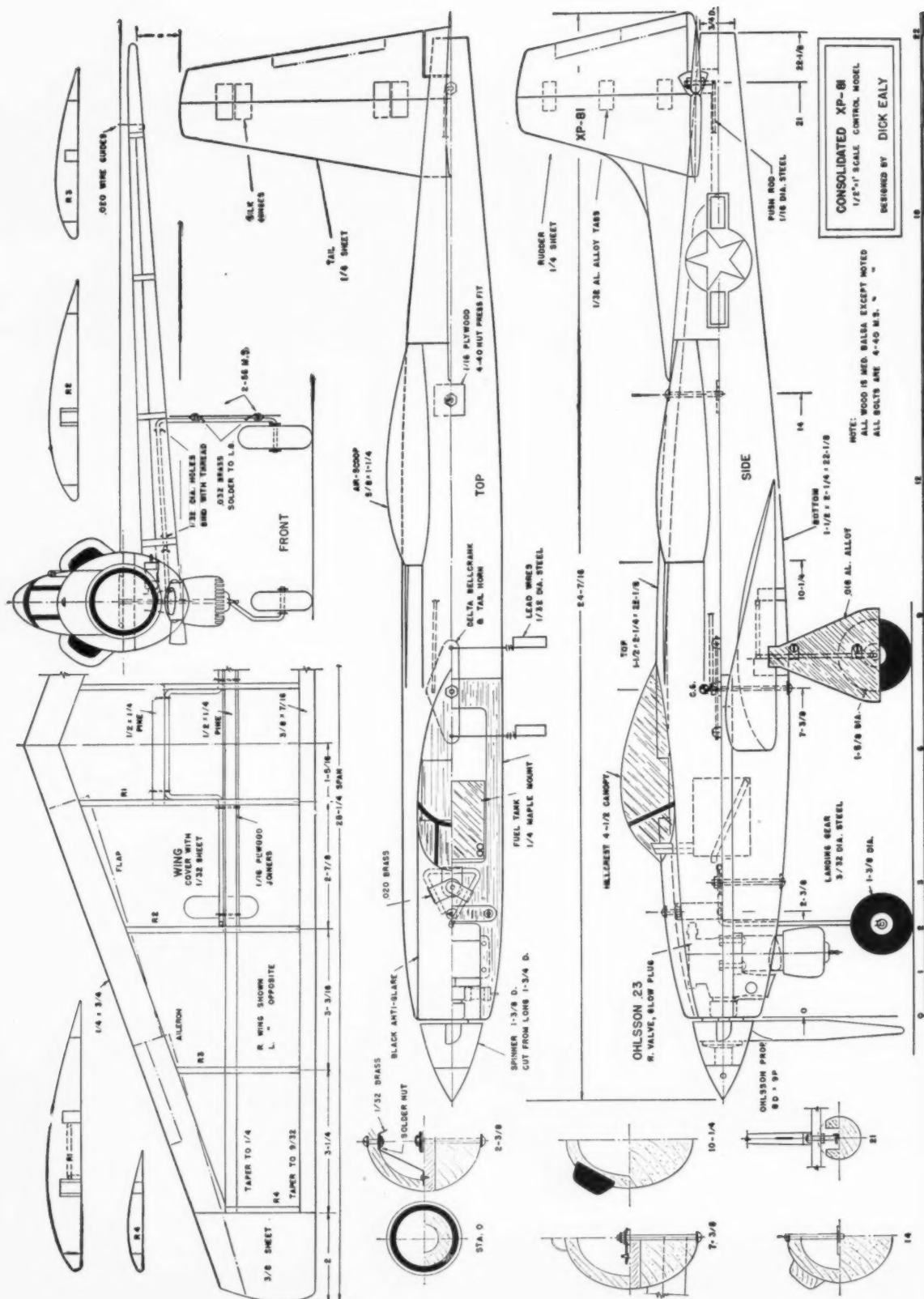
In 1924 the Air Force completely reorganized its designation system and redefined "A" aircraft as those designed for attack missions involving low-altitude machine-gun and light bomb attacks on enemy troops and targets of opportunity. Our older readers will well recall the brilliant series of attack planes pioneered by the Air Forces from 1924 to 1943. The deadly Curtiss *Falcon* biplane, the A-3, gained early fame as a low-flying scourge of enemy troops with its nose and wing-mounted .30 cal. machine-guns and light bombs. Gaily painted, the *Falcons* of the old 13th Attack Squadron, Ft. Crockett, Texas, pioneered the tactics and techniques of what the British called "ground cooperation" and gained a worldwide reputation for themselves and the (then) Army Air Corps.

The A-3 was followed by the deadly Curtiss A-8, A-10, and A-12 *Shrike* monoplanes with their heavily "trousered" landing gears and "huge" (400-lb.) bomb mounted beneath their belly. Then came the "modern" Northrop A-17 all-metal monoplanes with double-row radial engines. Harbinger of things to come was the Curtiss A-18, which revolutionized attack aviation by mounting two engines. This revolution was crystallized by appearance of the powerful Douglas A-20 twin-engine attack plane, which spelled-out the emergence of the attack plane as a full-fledged light bomber. Douglas improved the type with introduction of the A-26 *Invader* and the revolution was complete: here was truly a bomber, not an attack plane, and it spelled the coming death-knell of the type. In the midst of World War II a heavily-armed (four 20 mm. cannon) version of the fast North American *Mustang* fighter was produced especially for low-flying attacks and the Air Force promptly designated it the A-36.

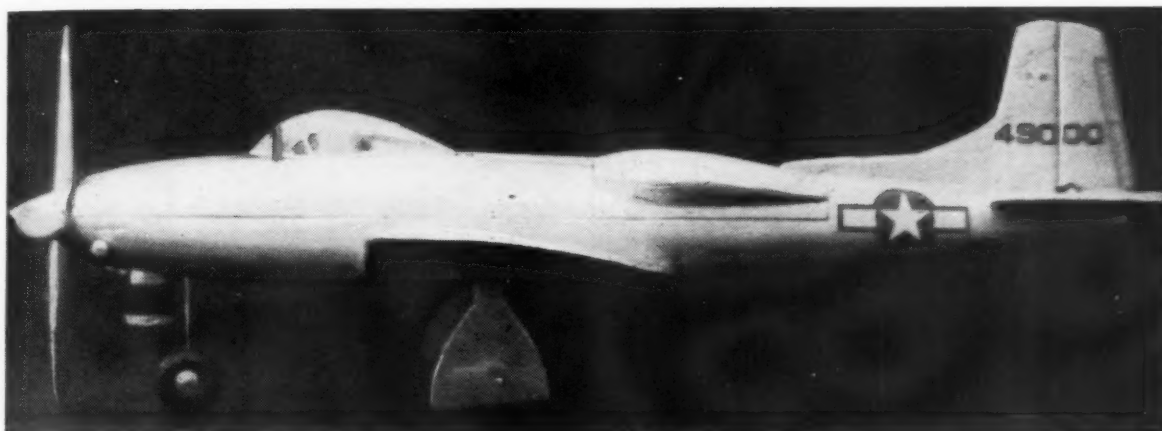
With the general line of development of the true attack plane having grown to bomber size and the actual tactical usage of

(Turn to page 46)





SCALE XP-81



by **DICK EALY**

THE XP-81 was the first USAF plane to fly with a gas-turbine engine designed for propeller drive. It has a General Electric TG-100 prop-jet in the nose, and a conventional GE-40 turbo-jet in the rear of the fuselage. Their combined power is the same as that produced by all four engines of the *Super Fortress*, making it one of the most powerful fighters in the sky.

The XP-81 was originally scheduled to act as an escort for B-29's and was designed to have an operating range of 1,500 miles, a combat ceiling of 37,000', and a high speed of over 500 mph with load. Its gross weight of 19,500 lbs. is indicative of the trend in larger and heavier fighter planes.

This airplane is a forerunner to fighters of the future. Already the Air Force has announced the Wright T-35 *Typhoon* turboprop engine developing 5,500 hp. And Northrop Aircraft has revealed the most powerful aircraft engine ever built—a 10,000 hp turboprop. Imagine the XP-81 with such power!

This XP-81 design makes an ideal U-control model built to $\frac{1}{2}$ "=1' scale. Our model is powered by an inverted Ohlsson .23 rotary valve engine. The tricycle landing gear protects the engine and makes take-off and landing easy.

CONSTRUCTION. Make the fuselage first. Cement top and bottom blocks together, using cement sparingly so it will be easy to pry them apart later for hollowing out and installation of the motor and controls. Next lay out full-size cardboard templates of the profile and the top of the fuselage. Place these templates on the blocks in proper position and draw the outline right on the wood.

Use a coping saw, or bandsaw, to cut away the surplus wood. Sand to pencil line. Repeat with top view template. Then round corners with knife as shown in various cross sections. Sand with No. 2/0 paper.

Pry the blocks apart and hollow out the top block as shown. Cut the top block apart just aft of air scoop. Make a $\frac{1}{4}$ " thick maple motor mount and trim a corresponding amount away from the lower block. Drill $\frac{7}{64}$ " dia. holes for two 4-40

machine screws in the lower block at stations 3" and 7-3/8". Use a gouge to cut the hole for the front landing gear strut. Bolt the Ohlsson .23 motor in place on the bottom of its maple mount, then nose strut should be placed into position and secured with a bolt at station 3".

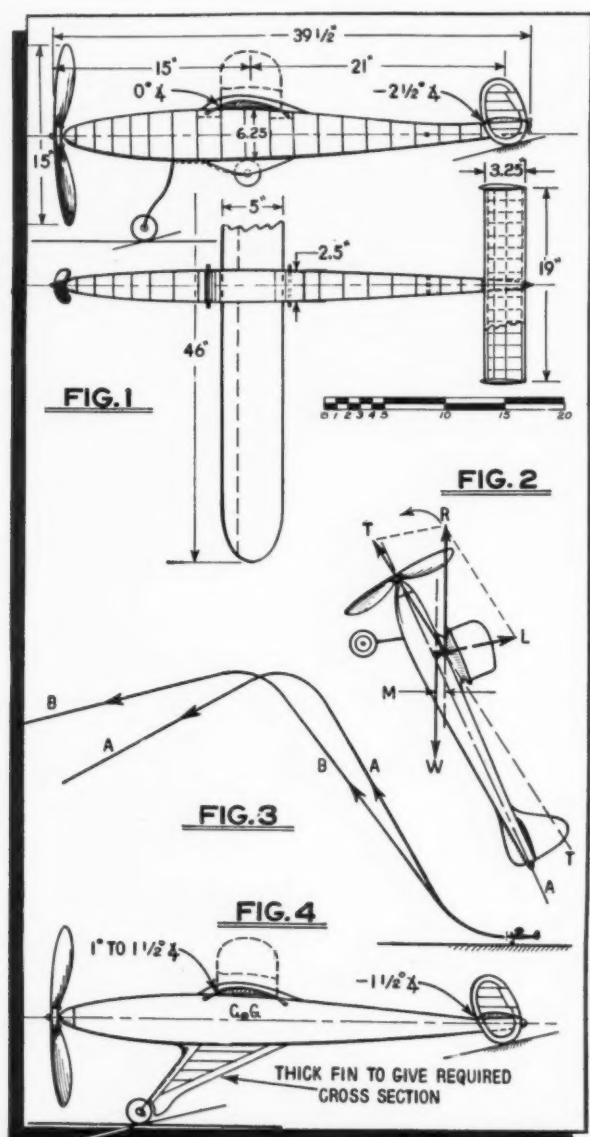
Make bellcrank installation next with a bolt at station 7-3/8". Hollow the bottom block to receive the fuel tank, which in our case measured $1\frac{1}{4}$ " deep x $1\frac{1}{2}$ " wide x $1\frac{3}{4}$ " long. The tail surface and rudder are both made from $\frac{1}{4}$ " sheet balsa. Install silk hinges and Delta tail horn on the elevator. Notch upper rear portion of fuselage to receive the horizontal tail surface. Be sure it is mounted parallel with the thrust line. Check by placing the assembly on a flat surface and using dividers or a surface gauge. A small notch about $\frac{3}{16}$ " sq. is routed on the underblock of the fuselage to allow movement of the push rod. Cement this upper rear portion to the lower fuselage block, after the push rod has been installed. Cement the rudder in place. Add the dorsal fin which is made from $\frac{1}{4}$ " sheet balsa.

Make the front and rear hold-down screws as illustrated at stations 2-3/8" and 14". Make air scoops and cement in place. Route out the air intake channels in front of them. See station $10\frac{1}{4}$ " on the plans. Cut cockpit hole, and holes for tank vents.

The wing is constructed next. First, make two $\frac{1}{16}$ " plywood joiners; they are $8\frac{1}{2}$ " long and have $\frac{5}{16}$ " dihedral on the bottom edge, as measured on both sides. The joiners extend out to rib R2 each side, and can be seen each side of the main spar on the wing top view. Make the wing ribs from $\frac{1}{8}$ " sheet balsa. The tapered pine spar is notched in the middle, bent upward to crack it for dihedral, and joiners are cemented in place. Build one-half of the wing at a time, working on a flat surface. The $\frac{1}{32}$ " dia. holes for attaching the landing gear should be drilled in the pine spar before assembly.

Bend up the main landing gear wire in one piece and notch R1 and R2 to receive it. Bind with button-hole thread and
(Turn to page 61)





DESIGN FORUM

by CHARLES H. GRANT

HAVE you ever designed a Wakefield Contest model? Of course, most of you know that the Wakefield Contest is the international classic held each year in the country which captured the Wakefield trophy the previous year. The trophy was donated many years ago by Lord Wakefield to stimulate international competition, but primarily, however, to bring together young men from various countries with the hope that a better international understanding would result. This competition has always been kept at a high standard of design and performance. Wise contest rules and specifications have made this the most scientific contest in existence today. First, a model must weigh a minimum 8 oz. and have a wing loading

of not less than 4 oz. per 100 sq. in. This is a comparatively heavy wing loading for rubber power, which makes careful designing necessary in order to achieve a winning performance.

To win a Wakefield Contest a model must be practically perfect in respect to stability and must possess maximum efficiency. Every factor has to be studied and worked out carefully. Usually the knowledge required for an efficient Wakefield model must be gained through experience. Nevertheless, a few suggestions from others and careful study of their procedure and results with Wakefield designing often saves a lot of time. We do not mean that it is wise to copy others exactly without mixing into the problem a little of your own thought and consideration. Usually the mere copyist never becomes more than a second rater—like those who memorize the textbook without thinking, thereby acquiring no real understanding of principles involved.

Fortunately, we are able to give you a rather complete story of how Mr. Charles R. Wood, of 3002 Forty-sixth Avenue, S.W., Seattle 6, Wash., tackled and solved the problem of designing a Wakefield model. His conclusions may be helpful to readers who wish to undertake such a project. Mr. Wood has built models since 1933—so he is no novice. He says that "this Wakefield business is by far the most interesting of all modeling." He started by designing and building a cabin Wakefield job and tells his story as follows:

"In my cabin Wakefield design I followed rather standard practice in that the wing was mounted high, on the cabin. The landing gear was of the fixed two-wheel type. There was a single rudder with a sub-rudder, and rounded tips on all surfaces. However, the over-all length was 39 1/2", somewhat longer than the average Wakefield models. Also, I used a long tail moment arm, 22" from midway on wing chord to tail midpoint. This cabin model, which was carried through three developments, was very successful. It was stable about all axes, a nice steady climber, and had a beautiful glide. Consistent times of over 3 min. were averaged in heavy cold air. However, I still wanted a model that would climb higher on the same power, and climb steadily during the whole power run. To do this and still keep the same flat, slow, glide was a real problem.

"It seemed to me that the best way to solve the problem was to reduce the drag to an absolute minimum, increase motor run, keep the weight down to 8 oz., and thereby reduce the sinking speed of the model.

"The cabin model had several shortcomings that showed up under various conditions—namely—the fixed wing was a headache, I couldn't shift it for C. G. changes, and as a result, had to add clay to restore balance. By having the wing strapped down to the cabin, I lost about 12.5 sq. in. of area and the wing mount contributed to drag. I thought of the English plug-in type but it was heavy and still didn't allow for shifting of the wing. The landing gear was heavy and also being fixed it contributed to drag.

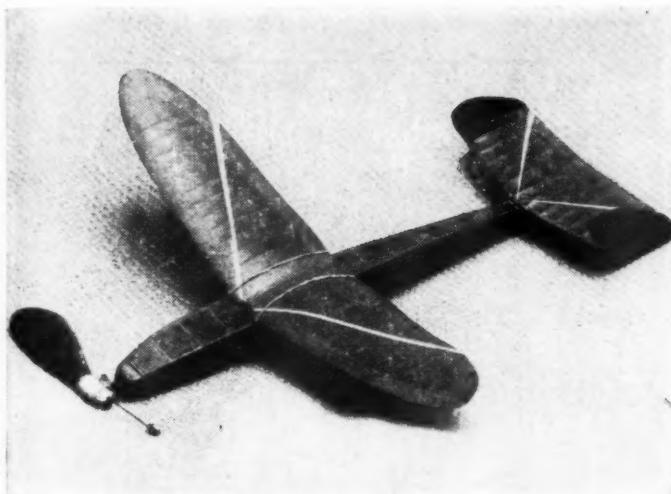
"I also found that in using high power (22 strands of 1/4" flat T-56 Brown Contest rubber) I had to use a lot of down-thrust to prevent stalling under the first burst of power; and then late in the climb, the prop slowed down and the down-thrust made the model cruise almost level.

"The solution to all these problems seemed to be to use a long fuselage, thereby getting a longer but still very powerful motor run. Keeping down the skin drag in such a long (39" O.A.) fuselage, was accomplished by using a small streamlined bulge to house the wing and another bulge on the bottom to house the landing gear wheel. The bulge on top was glued to the wing center section and this made it possible to shift the wing, eliminated the wing juncture drag, and loss of wing area over the top of the fuselage." (Fig. 1 shows the revised version with these features.)

"By mounting the wing in a shoulder position and increasing the nose moment arm from 12 1/2" to 15", I was able to eliminate all downthrust. The shoulder wing lowered the center of resistance as compared to the high wing and this greatly reduced the nosing-up couple that I found in the cabin model. However, I was still wondering if all of these changes would result in a spirally unstable model. The landing gear fairing was made nearly as long as the wing bulge and also as deep; this lowered the C.L.A. to a safe point and also kept the retracted wheel well below the fuselage outline to prevent tearing the covering when landing on rough ground. This landing gear feature has worked beautifully, the model has even landed across railroad tracks without getting a scratch, a normal fixed gear would have spilled the model on its back when it hit the first rail.

"The retractable landing gear is locked down with a rubber band and released with a short fuse; this eliminates premature folding and also keeps a little weight and lateral area under the nose, while the model is expending the first burst of power. This contributes to stability at the most crucial time—during

(Turn to page 42)

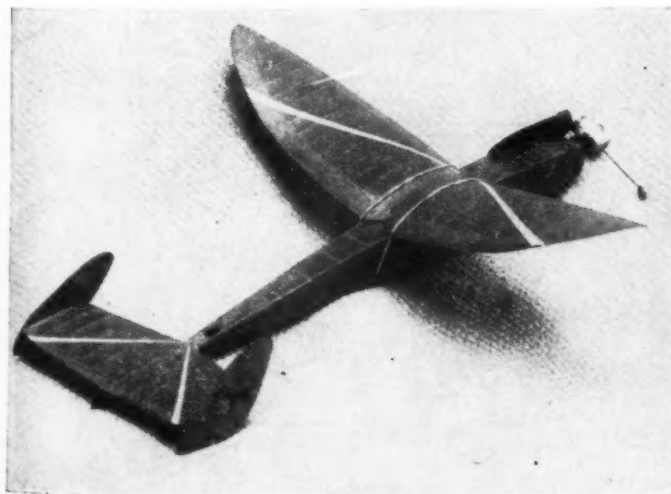


A simple model that can be flown with rubber or Campus A-100 CO2 power

BABY TOOTS

Many experts feel that a small rubber model is the ideal project for a beginner. We offer this design as a perfect type for the purpose—and fun for the more experienced builder as well

by KARL DIECKMAN



The folding prop adds to the fine flying results of this neat ship

VERITABLY spin proof and capable of averaging over 1 min. 20 secs. without the aid of thermals, *Baby Toots* is the epitome of small Class A rubber-powered models.

Employing a highly efficient elliptical Ritz wing, a lifting stab, and a one-bladed folding prop, this small 29 sq. in. inexpensively-built model is ideal for flying in restricted areas. Simple construction keeps the weight down to 1 oz. while permitting the use of six strands of $\frac{1}{16}$ " flat T-56 Brown Contest rubber, which really gets the model "up there" and allows it to make good use of its gliding ability.

For those who prefer CO2 to rubber power, it may be noted that a conversion using the *Campus A-100* gives most satisfying results. The model was found to be extremely stable under all types of engine performance.

Whether you like a sky rocket climb (rubber) or a long steady one (CO2 power) and don't particularly mind attracting a large crowd of spectators, this is that quickly built and easily adjusted model which will give you the most for your time and money. Before actual construction is begun, place the full scale drawings on a flat smooth board and cover them with wax paper.

WING. The sparsless Ritz wing makes for simple and quick building. Cut the outline from $\frac{1}{16}$ " x 3" sheet, sanding it down to an airfoil shape. Notch the inside of the leading and trailing edges, soak in warm water and pin them to the wing templates.

While this is drying, cut a rib template from a piece of hard $\frac{1}{16}$ " sheet, using this to cut out 20 ribs from a medium piece of $\frac{1}{32}$ " sheet. After the wing outline has been allowed to dry for at least two hours, remove it from the templates and insert the ribs. The dihedral is now added. Use cement liberally here, as the joint should be a strong one.

Allow the glue joints to dry thoroughly; sand down all ridges and cover with Jap tissue. Covering is done with the grain of the tissue running spanwise. It is important to cover the bottom sections first, and be sure to dope the tissue to each of the ribs. After having covered the entire wing, spray the tissue with water and when dry apply two coats of thin dope.

If a warp has occurred unavoidably, it may be removed easily by holding the wing over the flame of a gas stove and twisting it as desired.

FUSELAGE: Pin and glue the $\frac{1}{16}$ " sq. hard balsa longerons and crossbraces exactly in place over the drawing. Be sure to place the pins on each side of the wood and not through the longerons, or they will be weakened. Build two sides directly upon one another to insure accuracy and when these have dried thoroughly, remove and separate them with a sharp razor blade.

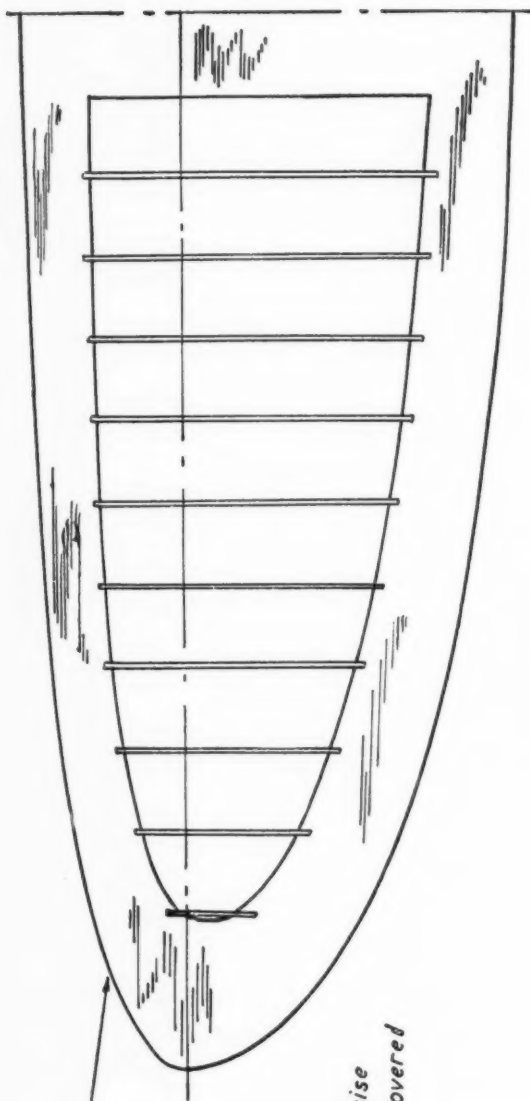
Join the sides together at the tail and nose; and when they are dry, add the remaining crosspieces. The $\frac{1}{16}$ " sheeting may now be added. The fuselage must be sanded smooth before covering. Use either a double layer of Jap tissue with the grain of the two layers crossed, or rubber model silkspan. Water spray and apply three coats of thinned out dope.

PROP AND NOSE BLOCK. The prop and nose block are carved from hard balsa according to the drawings. The folding mechanism is added and the entire assembly covered with tissue. Five or six coats of dope with intermittent sanding are applied. Extreme care and accuracy should be exercised in the construction of the propeller as it is here that effort really pays off!

Power is six strands of $\frac{1}{16}$ " flat T-56 Brown Contest rubber 14" long. A lube consisting of one-half part tincture of green soap and one-half part glycerin is worked into the rubber before winding.

STAB AND RUBBER. The construction here is self-explanatory.

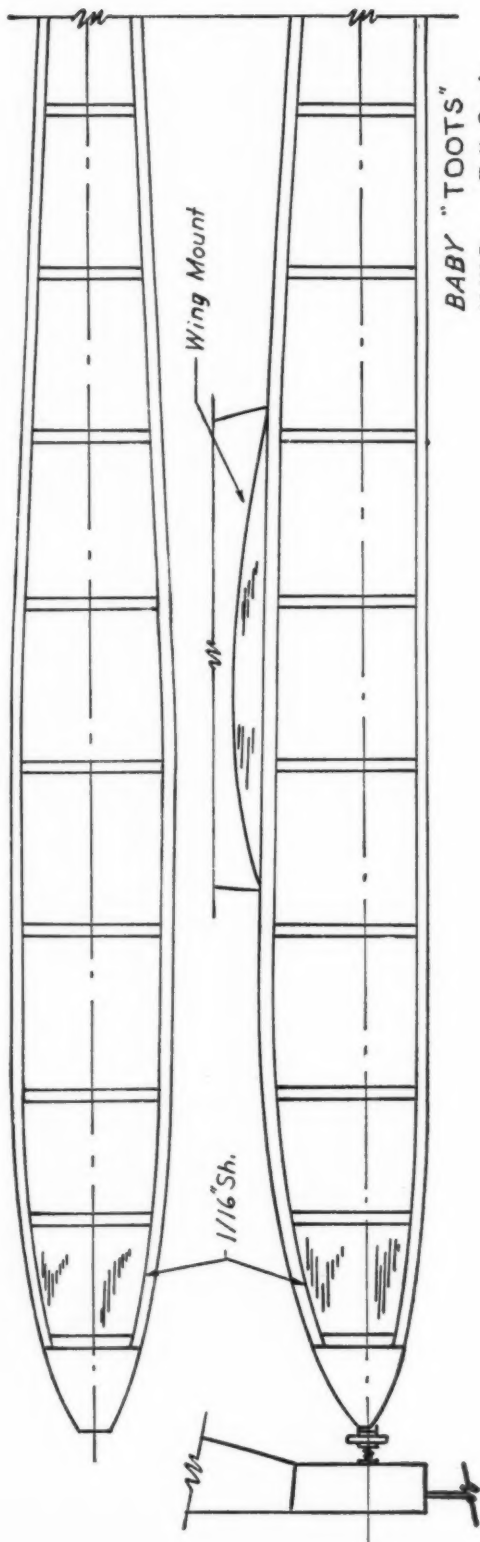
FLYING. Hand glides should first be made until a smooth, left circle glide is obtained. Adjust by moving the wing either back or forward as required. When the glide is to your satisfaction, the model may be tried under power. Fifty to one hundred winds are sufficient for primary adjustment. (Turn to page 48)



1/16" Sh. Wing Outline

Note: Add 1-1/2" dihedral under each wing tip. Allow to raise to 2" after wing is covered and doped.

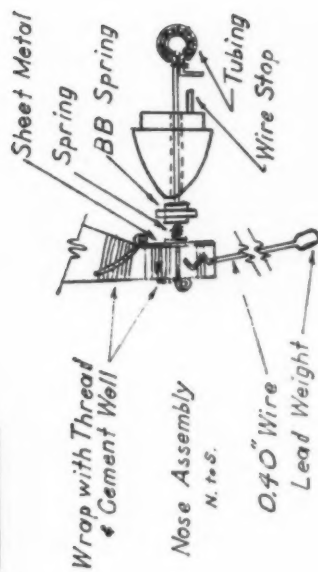
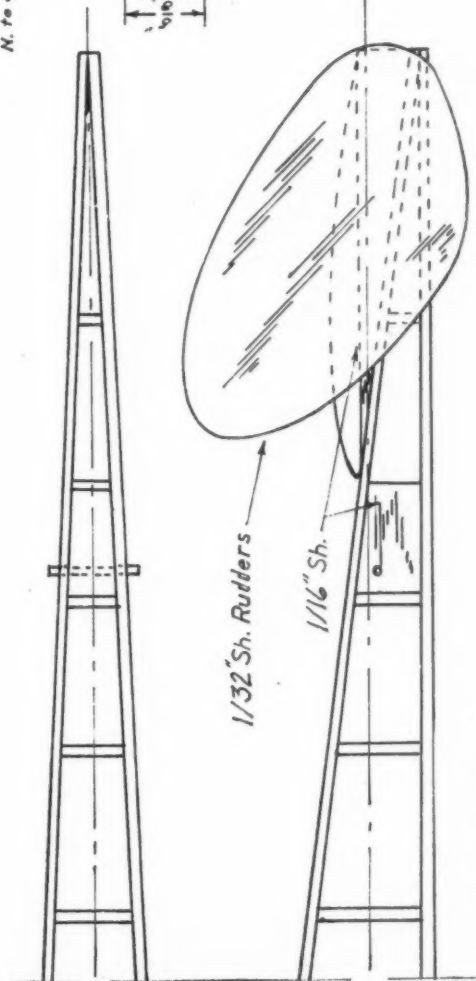
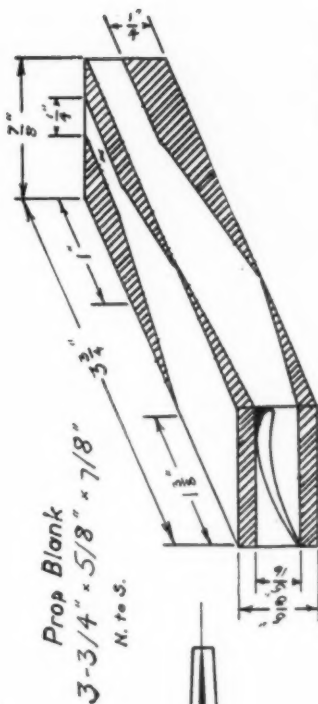
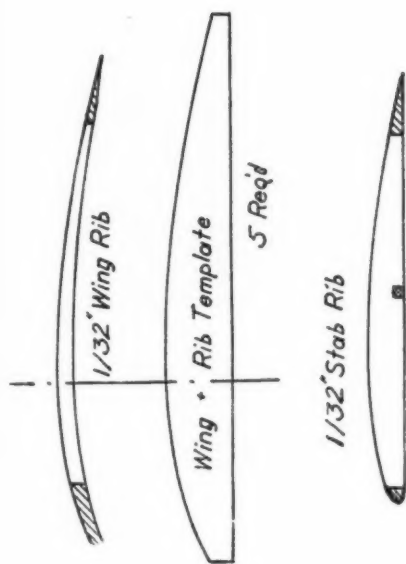
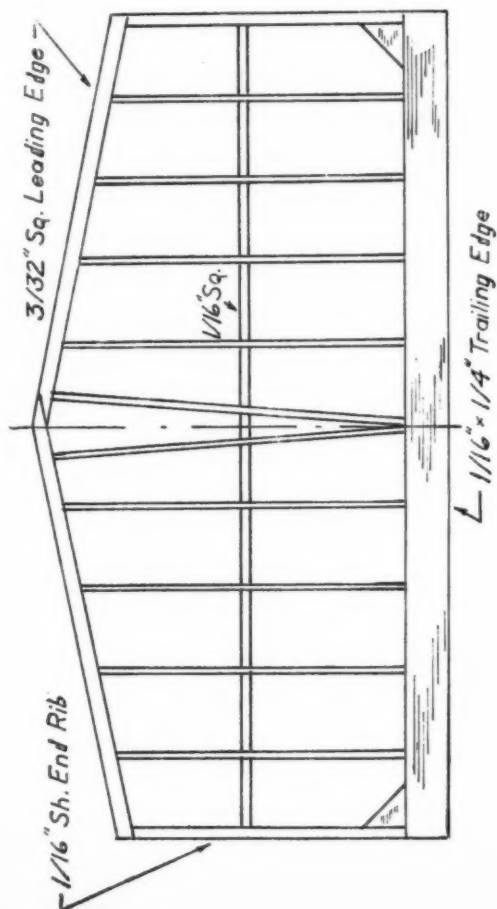
1/16" Sq. Fuselage Frame



Wing Mount

1/16" Sh.

BABY "TOOTS"
K.W.D. Full Scale



BABY "TOOTS"
K.W.D. Full Scale



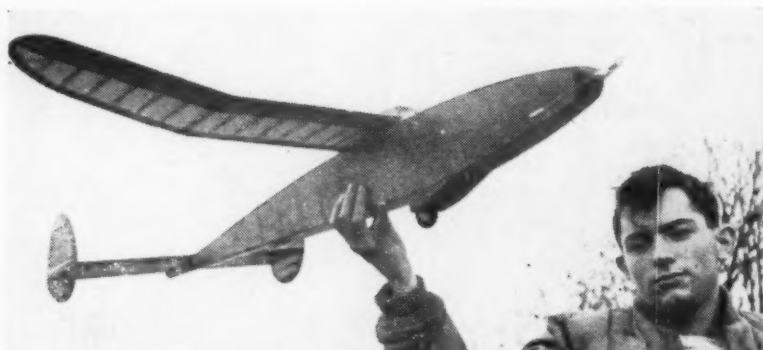
No. 1 Capt. R. S. Robinson pictured with his P-47 in Japan



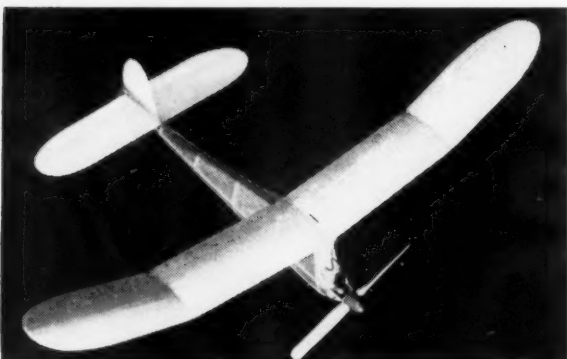
No. 2 Very stable flying wing by N. Piggott



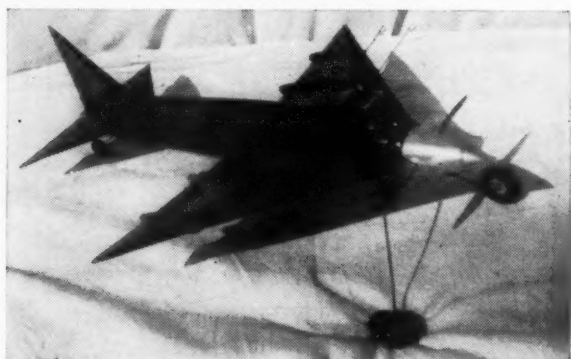
No. 3 Brayton Paul (left) and friend with jets



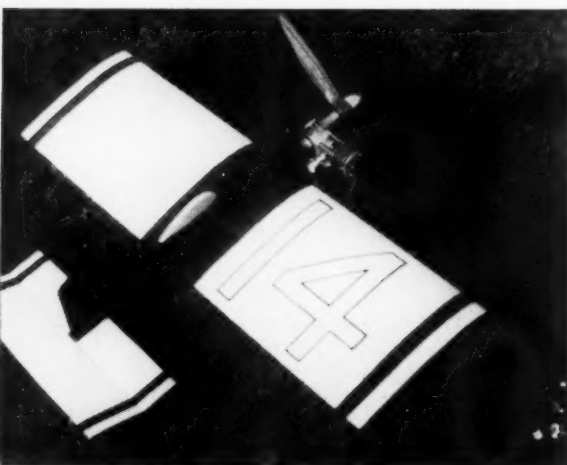
No. 4 J. Bloomer holds latest Wakefield design of Charles R. Wood



No. 5 "Scale model" Powerhouse by J. H. Maxwell has Campus CO₂ power



No. 6 "Air dams" made this controliner practical for L. Christensen

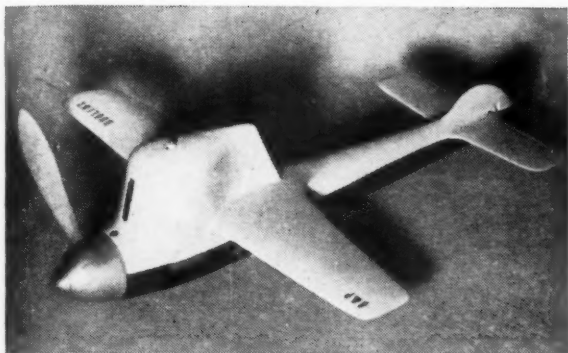


No. 7 A. E. Bailey flies this diesel-powered stunt job

Air Ways

NEWS OF MODEL AIRPLANE
EXPERIMENTERS FROM ALL
OVER THE WORLD

MODEL AIRPLANE NEWS • April, 1950



No. 8 Doering-powered speedster is very successful for J. R. Albrecht

PHOTOS AGAIN! We have always known that "Air Ways" is one of our most popular departments, and naturally, the better the photographs we are able to use the more our readers will get out of it. In order to encourage contributors to take real care in their photography and to send us outstandingly high-grade pictures for "Air Ways," we shall give each reader who sends a photo which is printed in this column a free one-year subscription, or extension (as the case may be), to **MODEL AIRPLANE NEWS**. This offer is effective with the present issue and will continue indefinitely.

Hold on! Don't grab your Brownie box camera and rush out to make some pictures. First, read over the "specifications" below; we receive hundreds of shots that are unusable for a variety of reasons, the most important of which are listed. Study these requirements; then walk out slowly with your camera and take some *good* pictures.

A.) The foremost requirement is that a picture be sharply in focus *all over* and that the model be photographed in front of a background that is not confusing and that shows the model to best advantage. In general, houses, autos, miscellaneous bushes, or groups of people make poor backgrounds. Lighting is also of greatest importance and, oddly enough, it is harder to make a good picture in bright sunlight than it is indoors with a few ordinary light bulbs, for in the latter case, the lighting is entirely under your control. We strongly suggest that readers study our series of articles on "Model Portraiture." These articles show that good photos are the result of care and knowledge, not necessarily of using the most expensive equipment.

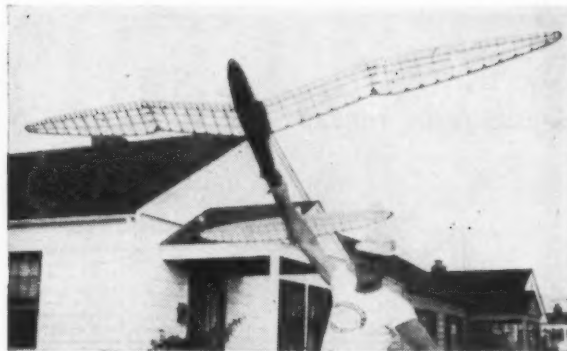
B.) The subject matter is naturally of the greatest importance. We have found that our readers study the "Air Ways" pictures to learn what new ideas other modelers have developed. So, if your dream ship has a new twist, different lines, on a special combination of features, other modelers will be interested in seeing a picture of it. Or again, if you have made substantial alterations in a standard kit model, that too is of interest. Experimental designs of all sorts are of greatest interest, not only the successful ones, but those that didn't pan out so well. If your "blockbuster" turns out to be just a dull thud, other readers will be glad to learn the details, so they may avoid similar pitfalls.

C.) Pictures should be at least 4" x 5" (the larger ones will get preference) and should be printed with glossy finish. We cannot use matte or dull-finish prints, colored transparencies, nor can we use negatives. Due to the large volume of pictures received, *we cannot return them*, either used or unused. Therefore, please don't request such return, enclose self-addressed envelopes, or send postage for this purpose.

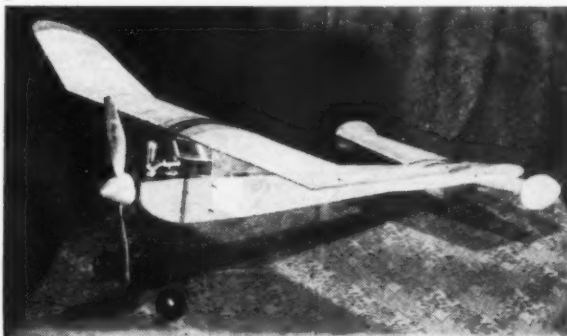
D.) Because we would like to spread the free subscriptions as widely as possible and also wish to have just as many different readers represented on these pages as space will permit, it's very doubtful that we shall use more than one photograph from any one reader within a year's time. If you want to send half a dozen or so from which we can choose, fine! But if it is a choice of sending one really good shot, or half a dozen that are just so-so . . . nuff said.

Well, let's see the *good* photos pour in—everything from solids to radio controlled B-36's. We especially want free flight gassies, gliders, all kinds of rubber-powered planes, radio control, etc. Oddly enough, we always have plenty of good control line pix, especially of the popular scale types, such as the Navion, P-47, the more-widely known WWI ships like the Fokker Tripe, Pete, etc. But send us your photos regardless; we would like to look over your work, and so would our readers.

CLUB MANUAL AVAILABLE. We learn that a new 24-page (Turn to page 56)



No. 9 10' Albatross glider, which Bob Colegrove flies with radio control



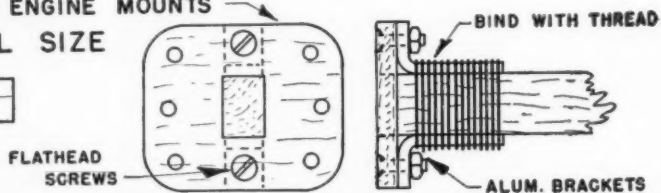
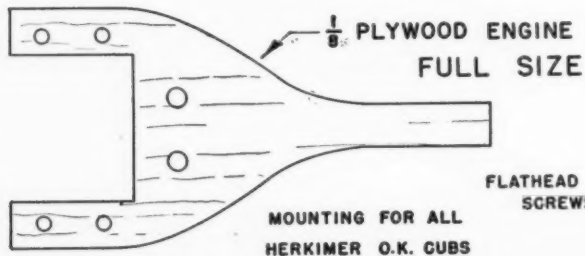
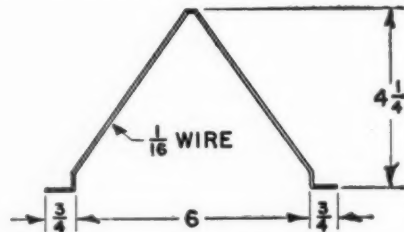
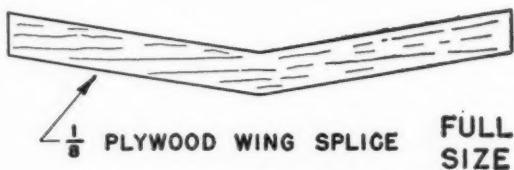
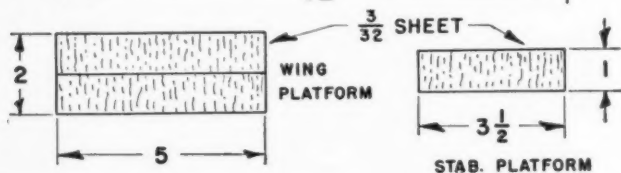
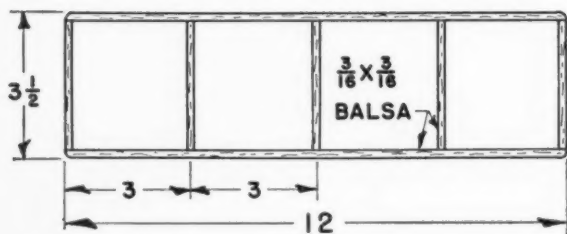
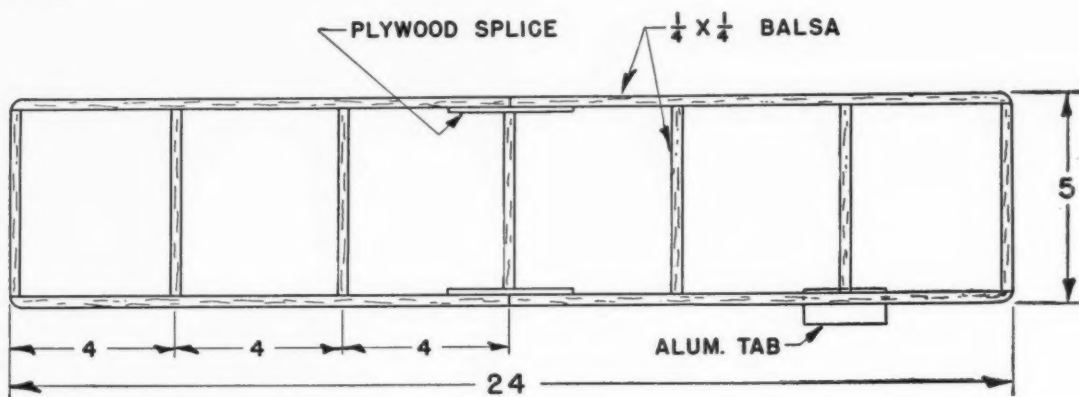
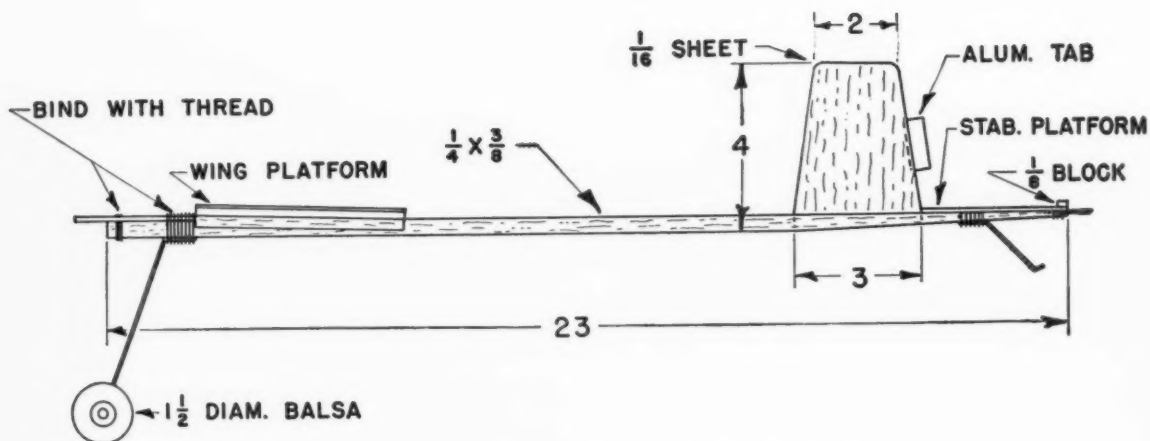
No. 10 Here's an Ay-Jay from M. A. N. plans, built by D. J. Lea



No. 11 Attractive semi-scale biplane is favorite stunter of K. Verthein

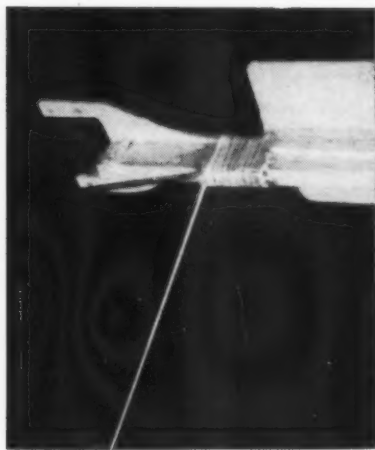
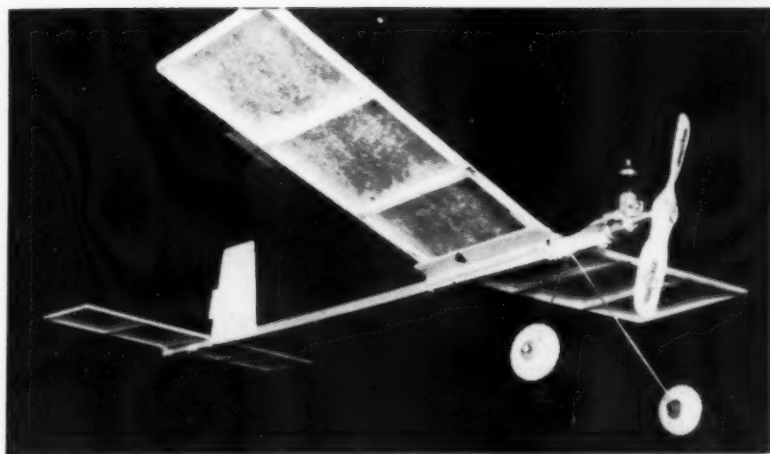


No. 12 H. Lansford sent this picture of Ellis Ross with Class B ship



MOUNTING AND HOLE LOCATION
K&B INFANTS, ANDERSON BABY SPITFIRE

THE ROGUE



Here's the old "Baby R.O.G." adapted to midget engines—a real Beginners' Special

by J. L. McLARTY

IF YOU are over thirty years of age and have been building models most of that time, you will understand the fun you can get out of this R. O. G. model. Do not let its simplicity fool you; many expert model builders owe their ability and success to the knowledge gained through flying R. O. G. models.

Perhaps a brief explanation of the *ROGue's* qualities will be of interest to young builders. First, the flat wing without so called airfoil rib sections is not as crude as it might seem. A flat section is actually the most stable in that the center of pressure moves backward at high angles to automatically correct the models attitude. Because of the low model weight, the angle of attack is low, so there is little more drag than on a streamlined section. Also, although the wing stalls at a lower angle than regular sections, it mushes instead of stalling suddenly. An R. O. G. model also uses a generous sized stabilizer with a negative angle-of-attack. The center of gravity is slightly forward of the center of pressure on the wing. This combined with generous dihedral and not too low C. G. makes an extremely stable model for flying in all kinds of weather. Critical adjustments are not necessary for satisfactory flights. This particular model is designed for any power plant up to 2 oz. in weight, which includes the .099 midget engines. There are no formed ribs. The wing splice and mounting details are shown full size.

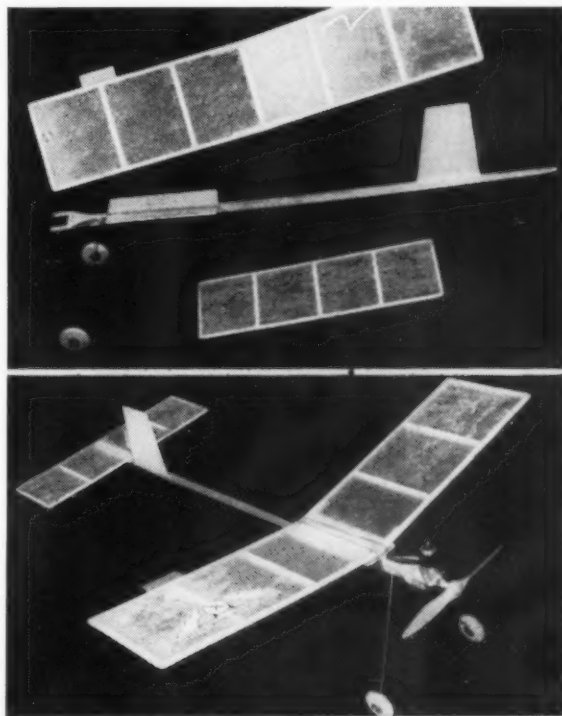
First, decide which engine you are to use; then pick one of the two mounts shown on the plans and cut from $\frac{1}{8}$ " plywood, also cut two wing splices from the plywood; these are also shown full size on the plan. Be certain the grain is as shown. For the fuselage, take a $\frac{1}{4}$ " x $\frac{3}{8}$ " hard balsa strip and taper the rear as shown. From $\frac{1}{32}$ " piano wire, bend the tail skid and rear stabilizer attachment wire. Bind these with linen thread and cement to the fuselage stick. Form the landing gear from $\frac{1}{16}$ " piano wire, as in the drawing. Place the engine mount and gear in place and bind with linen thread and cement both in place. Be certain the engine mount is straight. Cut out the wing and stabilizer platforms with the grain as shown. Cement in place, using the wing splice to get the proper angle to the wing platform. Cement $\frac{3}{32}$ " x $\frac{1}{4}$ " x 5" strips under each side of the wing platform. Cut the rudder from $\frac{1}{16}$ " balsa and cement to the side of the fuselage stick as shown. Cement a $\frac{1}{4}$ " thick by 1" long balsa block on the rear of the stabilizer platform, place $1\frac{1}{2}$ " balsa wheels on the landing gear, and the fuselage is complete.

The wing is built entirely of $\frac{1}{4}$ " sq. medium balsa with two plywood splices at its center to give the correct dihedral. The stabilizer is of $\frac{3}{16}$ " sq. balsa. Construct both surfaces on a flat board. Small .005" aluminum tabs cemented to the rudder and wing will help control the direction of the model's flight. Both wing and stabilizer edges may be rounded. Both should be covered on the upper side only with lightweight silkspan.

All joints on the model should have at least three applications of cement. The entire model should be well gone over

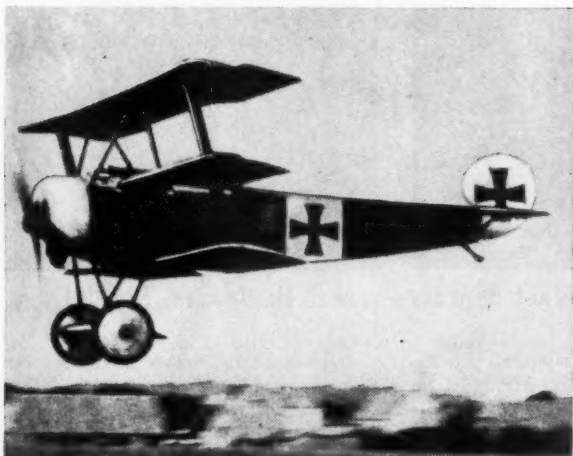
with fuelproof dope. Use No. 2 or 3 machine screws for mounting the engine. Be certain the engine is in line with the fuselage. Wing and tail are held on with rubber bands, three or four on the wing, and two on the tail. The model should balance $1\frac{1}{2}$ " back from the wing leading edge. Glide the model, adjusting the stabilizer angle with balsa blocks until the glide is flat. Try first flights under low power until the adjustments give you a smooth climb and glide. The aluminum tabs are to take care of wing warps and to enable you to make the model fly in different directions.

A clear plastic tube which can be dipped in the fuel, then be removed when you are ready to fly, will give you 10 to 20 secs. of flight. One of the small commercial fuel tanks can be held on the plywood mount with a rubber band for longer flights. Use low pitch propellers.

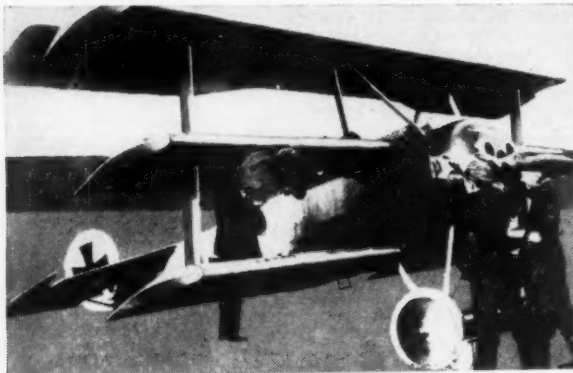


Part Two WORLD WAR I FOKKER TRIPLANE

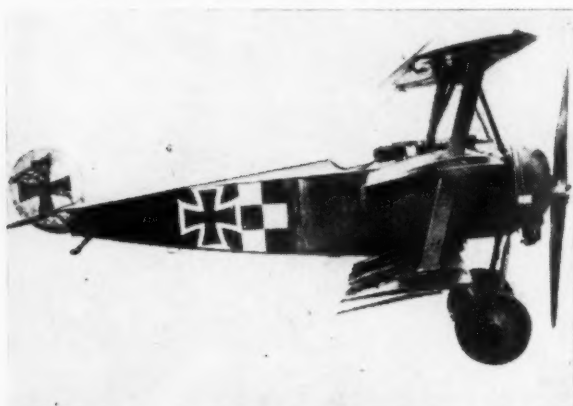
by ROBERT C. HARE



Here is a Fokker Dr. I settling in for a landing



Two mechanics wait for the signal to wind up this Tripe



The simple lines of this famous ship are clearly evident in this view

THE science of aerodynamics was so new during World War I and the opinions of aviation engineers so individualistic, that it was common practice for one designer to openly poo-poo the efforts of another. In their search for perfection in those early days, the "let's try this" attitude was prevalent. If a plane, involving something new, flew at all, it was a success; if the application of theory failed just once in practice, no matter how sound the theory; then even the theory was looked upon askance.

Aeronautical discussions were not limited to the science of flight alone in those days. What material to make this or that part of kindled many a heated argument. As in every discussion, there were the extremists—the all-wood advocates and the all-metal advocates—constantly on each other's toes. A middle-of-the-road man, the designer who used metal or wood freely wherever he thought best, was a man to be pitied. He bore the brunt of criticism from both extremists!

Anthony Fokker, or more correctly, the planes he designed had been discussed pro and con for years. From his earliest days, Fokker had advocated steel tubing for framing. But in designing for production quantities, he found that wood was better for some parts. As a general rule, German designers were either all-wood or all-metal advocates, as were the French: the English designers were of the wood school exclusively as far as production aircraft were concerned.

You can imagine, then, the howl that went up from the critics of all the belligerents when a plane built by so famous and successful a designer as Fokker was captured by the Allies, and through official reports was described in detail. But when the Fokker triplane was captured, another controversy arose to brighten the hearts of those critics who were for and against cantilever wing construction, and the monoplane versus biplane versus triplane boys!

FOKKER DR. I WINGS. The predominance of biplanes over any other wing arrangement during World War I was, of course, a matter of expedience rather than stubbornness on the part of designers. It was simply easier to build a strong biplane structure with the materials and engineering knowledge then available than it was to build a monoplane with an equivalent strength weight-drag ratio.

It was somewhat of a surprise, then, when Fokker produced a triplane. What with his reputation for unusual and advanced design theories, it would have been more like Fokker to come up with the toughest one of all—a cantilever monoplane. (He did later, with his D.VIII.) So it was not surprising, therefore, that the Fokker triplane was regarded with skepticism on three counts: the fact it was a triplane; its cantilever construction; and its thick, "anti-high speed" airfoil section and peculiar spar structure. There was a great deal of speculation among Allied designers in particular, whether or not Fokker had gained anything resistance-wise by saving on bracing wire drag by use of a thick spar system, and secondly, was his system strong enough after all?

Oddly, it remained for an American, Dr. Jerome C. Hunsaker, of M.I.T., to give the solution. In the summer of 1916, Dr. Hunsaker carried out a series of structural tests on triplane combinations utilizing the RAF 6 airfoil section. When his results were applied to the Fokker Dr. I, the Allies were able to determine with remarkable accuracy, just what Fokker's engineers had calculated for the three-winger's stresses. A captured Fokker triplane was stress-analyzed in this manner:

The weight of the machine was about 1,260 lbs., the area of the top wing was 83 sq. ft.; that of the middle wing 54.5 sq. ft.; and the lower wing 51.9 sq. ft. Assuming the lift distribution to be the same as found by Dr. Hunsaker, a lift of 9.21 lbs./sq. ft. was attributed to the upper wing: 3.09 lbs./sq. ft. for the middle wing and 6.14 lbs./sq. ft. for the lower wing, giving an average loading equal to that of the lower wing.

It was easy to determine, at this point, that struts in the Fokker were merely ties which would cause the more lightly loaded middle and lower wings to support some of the load on the top wing, taking into account their shorter span and the fact that the wing spar in all three wings was identical.

It was further determined that the bending moment on the wing spars, according to their loading, amounted to about 14,500 lbs./in. At this point, Allied analysts calculated the strength of the spruce box spars in terms of a bending moment of 133,790 lb./sq. in. Then, presuming that the normal center of pressure of the Fokker airfoil would be in line with one flange of the composite spar, they reduced the strength of the spar in half, just to be on the safe side in their calculation. That gave them a moment of resistance of 66,895 lbs./in. for the spar against a calculated bending moment of 14,500 lb./in., or a safety factor of 4.5.

This description is necessarily devoid of detailed calculations because of space limitations, but shows how thoroughly an enemy airplane was examined, even in World War I.

(Turn to page 50)

HERE'S THE THEORY

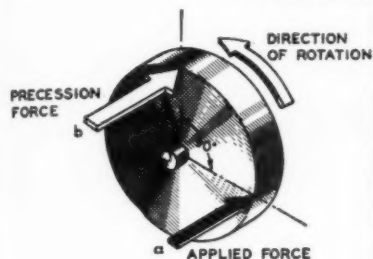


FIGURE 1A

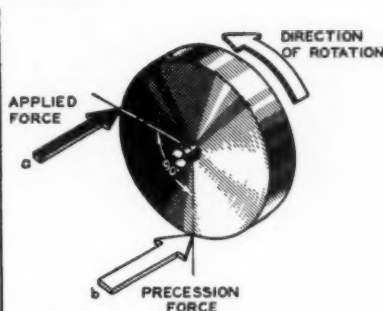


FIGURE 2A

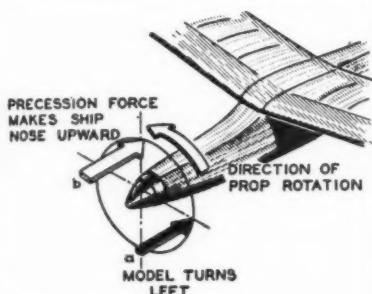


FIGURE 1B

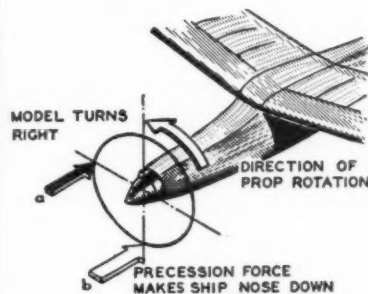


FIGURE 2B

WENNERSTROM

ELIMINATE THE GYROSCOPE

EVERY so often some model flier "discovers" the gyroscopic reaction of the propeller and the force known as "precession." He immediately blames all of his flying troubles on this single phenomenon and goes about preaching his gospel to unsuspecting modelers everywhere. As a result, airplanes that were flying nicely are splattered right and left.

Sometimes, the "discoverer" of gyroscopic forces is a trained engineer, and therefore, his opinions are highly respected by his fellow modelers, which makes matters all the worse. He remembers his textbook lessons and applies them to model aircraft. Sometimes, he attempts to prove his theory. But, it is too much of a task for him to actually take measurements and calculate this force and to compare it with other forces acting on the airplane. Instead, he tries a "control experiment" in which he attempts to control all other forces acting on the ship and varies only the force being studied, in order to determine its action on the airplane.

This is an excellent method for obtaining knowledge and is the method used by science. But, the experimenter must be sure that all other forces are controlled or his results will not be correct. Unfortunately, the average experimenter who is so sold on the importance of gyroscopic forces has not done a very good

job of controlling his experiment. For actually, gyroscopic forces are so small that they can be eliminated entirely as a factor to cope with in model aircraft.

Before going any further, let's be sure that we understand just what these gyroscopic forces are and how they are supposed to act to crack up models.

Fig. 1A shows a gyroscope turning in the direction indicated. When a force is applied at "a," causing rotation in that direction, then another force, 90° distant from that force in the direction of rotation of the gyroscope (at point "b") is set up which causes rotation in the direction indicated. This force is called "precession." Applying this to model aircraft, Fig. 1B shows a prop turning in the same direction as the gyroscope above. As it is turning fast and has considerable

by DON FOOTE

weight, it acts as a gyroscope. Now, if a force is applied at "a" (the airplane goes into a left turn), then a precession force appears at "b" which causes the rotation indicated. In other words, if the model goes into a left turn in the climb, a precession force will be set up that will tend to make the model nose upward. Hence, there will be a force acting to prevent spiral dives or "spinning in" when the model is made to turn to the left in the climb.

Fig. 2A shows the precession force when the applied force is on the right side. Thus, when a model is made to turn to the right, a precession force is set up which tends to force the nose of the model downward and the airplane will spiral dive or "spin in."

All this theory, as far as it goes, is absolutely correct. The forces are there, and no one can deny it. But, the resulting precession forces set up as a result of a turn to the right or to the left in the climb are so small in comparison with some of the other forces set up at high speeds that they can be eliminated entirely as factors to consider in adjustments.

There are four adjustments (perhaps they should be called defects) which produce far more powerful forces at high speeds. When improperly made, these adjustments are always the direct cause of spiral dives. They are: warped wings, warped stabilizers, a turned rudder, and side thrust in the engine.

I have eliminated torque in this discussion because I have assumed that the flier will not change propellers, and therefore, torque will remain constant and will be balanced by an adjustment in one of the four items listed.

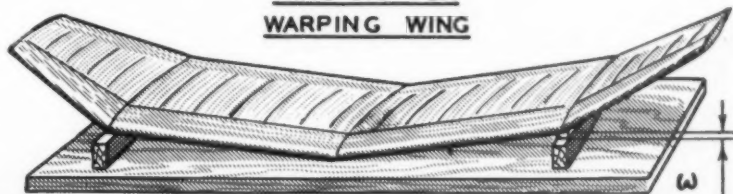
By holding any two of these factors constant, and varying the other two, any model can be made to spiral dive to the left, climb beautifully to the right, or to climb beautifully to the left while it will spiral dive to the right. And this applies to all well-designed models regardless of design. Always when a model spiral dives, it is the flier and not the ship that is at fault.

Here is an example of a controlled experiment that will serve to show that the gyroscopic reaction of the prop is infinitesimal in comparison with the forces set up by one of the above adjustments.

First, be sure that the rudder is pointed absolutely straight ahead and that there is no warp in the stabilizer. These two surfaces will remain constant and in a neutral position through out the experiment. Next, put a warp of about $\frac{3}{8}$ " in the left side of the wing by raising the leading edge this amount at the dihedral joint or about half way out on the wing if the wing is the type which has only a dihedral joint at its center. To do this, make a jig from blocks so that the warps can be positively controlled. See Fig. 3. Warp the wing by painting it with thinner

(Turn to page 60)

WING JIG FOR WARPING WING



ADDITIONAL $\frac{3}{8}$ " BLOCK



whirli CO₂ pter

by ROY L. CLOUGH, Jr.

ONE evening of fairly intensive work will put this little whirligig-type helicopter aloft.

The construction is quite simple and offers no problems to the builder who is handy with a soldering iron. Good balance without excessive weight is the primary consideration, and care along this line will result in good flight performance.

A Campus Bee was used for the original and proved to be very reliable. A bit

of cellulose tape which can be flipped over the filler hole after charging, to keep dirt out, is good performance insurance because of the exposed nature of the model.

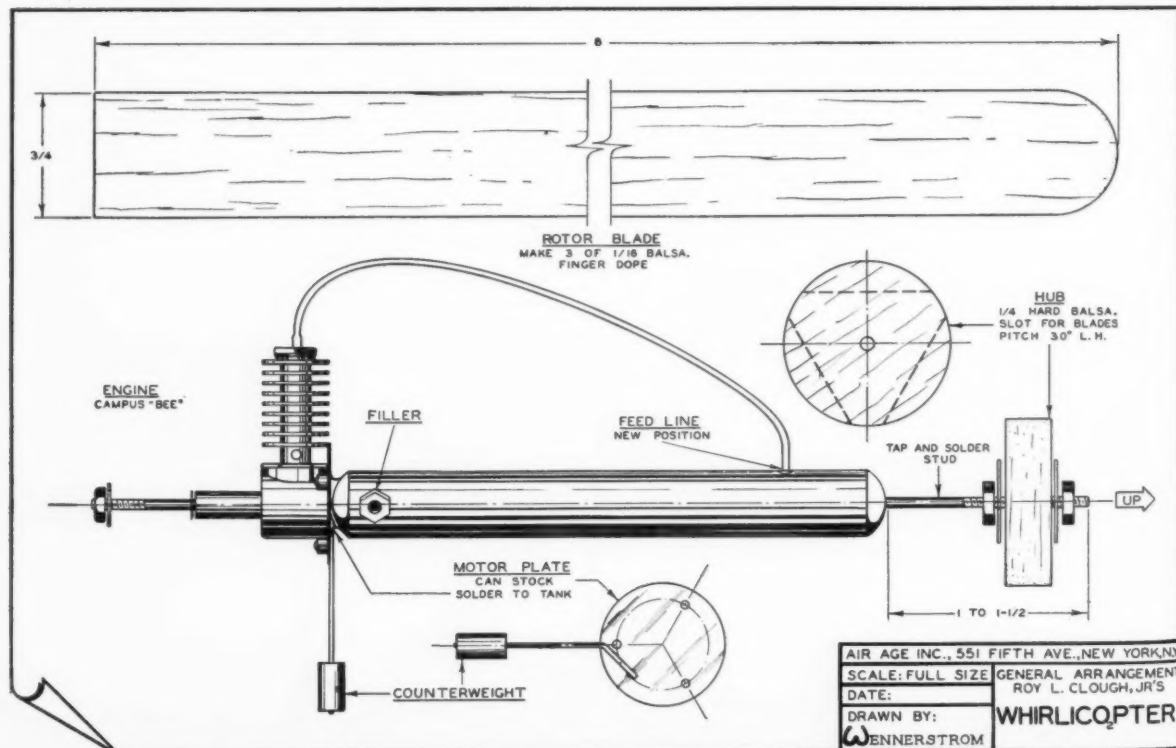
Begin construction by unscrewing the filler valve. Put this in some safe place until again needed, taking care not to lose the tiny rubber plug which serves as a check valve. Unsolder the feed line at the tank end. A 2-56 or 3-48 stud, an inch long, is tapped, then soldered in the hole.

Lay out the motor mounting holes on a $\frac{3}{4}$ " disk of tin can stock, punch or drill them and solder the disk to the lower end of the tank.

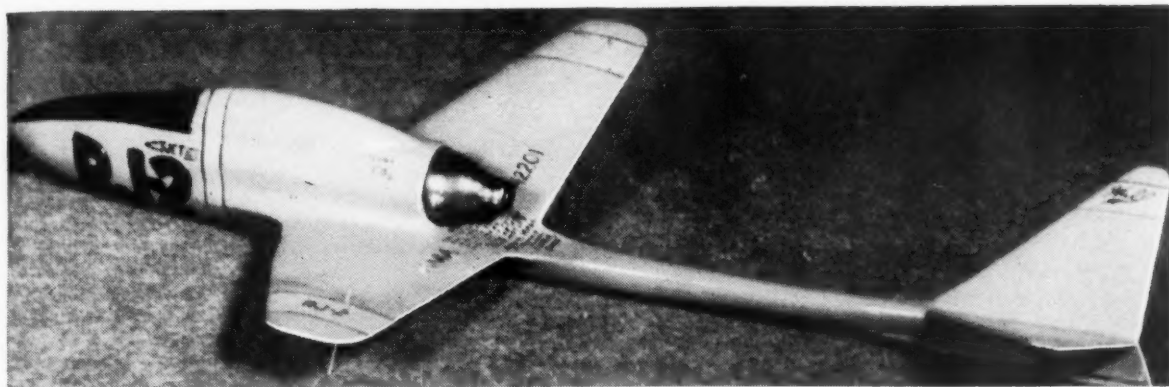
Next mount the engine with common pins which are bent over and soldered securely in place. While doing this, carefully check the alignment of the crankshaft with the tank and the stud. A bit of $\frac{1}{16}$ " rod is soldered to the tin disk opposite the cylinder, the end of this being wrapped with a few turns of tinned copper wire to serve as a counterweight. The counterweighting may be done very exactly, as follows: wrap the wire on fairly tight until it seems correct; then slide the wrapping a bit one way or the other for fine balance. When you find it, heat the end of the rod briefly and the wire will "tin on" and stay put.

Drill a new hole for the feed line near the top of the tank and on the opposite side from the filler valve. Solder the line in place carefully, to prevent leakage.

The big rotor is made from a good springy variety of balsa which may be finger-doped for added toughness. It is of left-hand pitch to permit the interchange of various easy-to-obtain right-hand propellers on the motor end. We have used the Hillcrest adjustable plastic-blade prop and also Monogram kit props with fairly good results but top performance will come from a wood propeller carved to fit the individual machine. The fairly small total area of the rotor system results in a rather rapid descent, but is necessary because the engine must turn up quite rapidly in order to develop enough power to fly the machine. There is, of course, a very favorable heat-exchange setup because of the rapid motion of the cylinder through the air as the tank rotates, but set the motor at near maximum output to get the best results altitude-wise. One word of caution: be absolutely certain the motor is running in the right direction when released!



SPEEDJET



by ARCH J. HALL

PRIOR to this application of CO2 capsule power, models we've seen have been rather large, built-up in construction, and at best have attained only moderate speeds.

Two of us were flying this type model and witnessed a strange accident. Once the model crashed immediately upon launching, throwing the capsule on the ground. While still under power, the capsule bounced up two feet and flew ten feet towards us at a walking pace, dropping almost at our feet. If a capsule would fly all by itself, we reasoned that a small airplane should attain great speeds with this much power available. We sportingly challenged each other to a race and set a few building specifications, one being that a ten inch wingspan be used. This proved to be too much wing and resulted in high speed endurance flights. In fact, one model attained heights of 200 to 300 feet and was lost on a glide over two city blocks distance.

The Speedjet was evolved from these models with major changes made to attain the level high speed flight desired. Construction was changed to solid, for built-up models simply smashed themselves to pieces when hitting anything at 90 to 100 mph. The tendency of a gun to punch a hole offside in the jet resulted in whipping turns, so tail area and moment arm were increased. The boom was shifted below the line of thrust, and "V" tails with a sub-rudder were used both to lower the rear center of lateral area, and to provide ease of launching. This lowered rear area also helps keep the plane from violently whipping into the ground, if banking and turning steeply. Lastly, the span was cut to prevent excess climb and to make level flights possible.

Construction is a matter of but a few hours. The plane is best started by soaking the jet tube housing sheet in hot water for a few minutes. Wrap this around the capsule and hold with a rubberband until dry. While this is drying, work can be done on the body. It is made in two sections for ease of construction and eliminates sawing out large sections of one block. The bottom section is flat on top with "V" cuts, as noted on plan, to receive the wing and tails. Note that the top outline provides a wide wing seat, which is later sanded into a smooth fillet extending out onto the underside of the wings. This method is much easier than trying

to build and fit extra pieces to form fillets. It is advisable to leave the entire lower body in the rough state and to cut out the wings. Sand the airfoil into them to within about one inch of where they join, as you will want to blend the fillet right out onto the airfoil. Block each tip up $\frac{3}{4}$ " and carefully shave the center ends to a good fit. Glue securely, building up at least two thin skins of glue across this joint. While drying, complete the tail in the same manner.

When the wing is dry it may be glued into the lower body. Cut out the block forming the upper front part of the body, noting that this block extends up to the forward end of the jet tube housing and serves as a stop for the capsule butting against it. Assemble to the lower fuselage by gluing and inserting two pins as shown on plan. If the housing is dry, glue together at the joints. It may now be fastened atop the wing and butted against the upper front block. Fill in with balsa or plastic substance to form the fillet from capsule to wing. The carving and sanding of the fuselage and fillets may now be done with a minimum of effort. To shape the upper half of the body, use the capsule housing as a guide and carve forward to blend into the section shown at A-A. In section C-C you will note that the crosssectioned area is the boom, and is smaller than the outside outline which is the maximum fuselage area, seen at about B-B. This is so because the fuselage from B-B narrows down to a boom shape at D-D. Careful sanding and carving will produce a smooth change thru this section, and a nice fillet out onto each wing. Carefully fit the tails in place and build up two skins of glue around them.

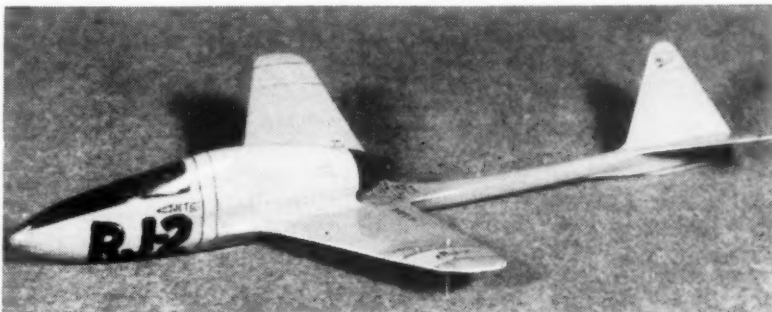
The harder part of construction is over, leaving only the details of carving and attaching the hollow headrest and installing the celluloid windshield.

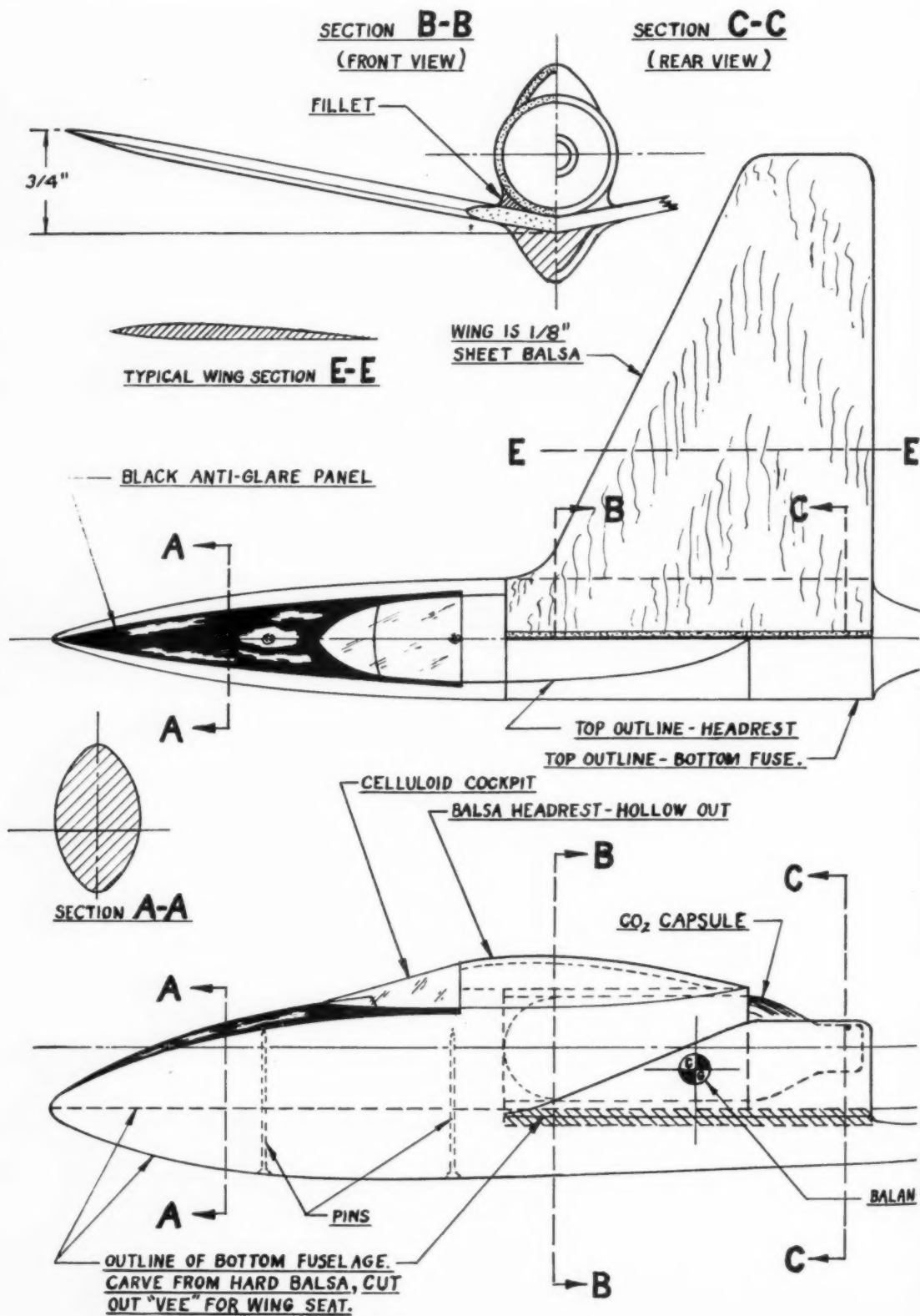
To finish the model, fill in with at least two coats of filler, a coat or two of clear dope, and several coats of thinned out colored dope. Sand lightly between coats with wet sandpaper and rub down the last coat of dope with a good rubbing compound. Wax the model and rub to a high finish for better speeds. We had trouble following ours and finding it later, because of its small size, so we went all out and painted it up fancy. It is much easier to see, with the yellow wing stripes.

Although a small and fairly easily built model, it must be said that alignment has to be very accurate, as at the speeds attained, the slightest warp or misalignment produces spectacular results. Trying some adjustments for the fun of it, the model has been seen to complete whizzing loops—inside and outside, whipping turns, vertical snap and slow rolls, and "everything in the book."

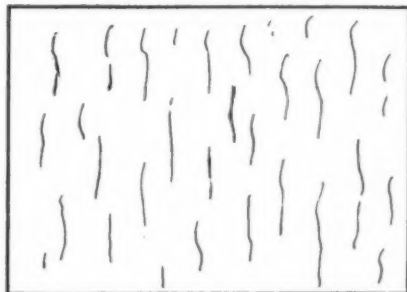
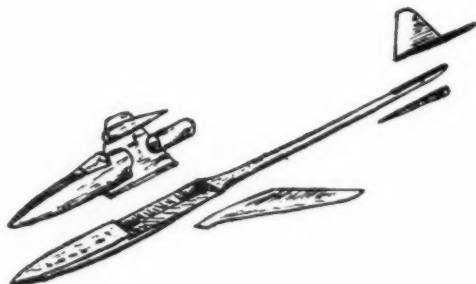
However, after choosing a large grassy field and making a few adjustments you will be amazed at the straight speed dashes attainable. It will tear along 300 or 500 feet at 100 mph. or more and glide swiftly in to a landing. Experiment by punching different size holes in the capsule until maximum power is attained. You will have a lot of enjoyment from flying a miniature jet job that performs as spectacularly as do the real ones.

Credit must be extended to my twin brother and close modeling associate, Arthur I. Hall, who contributed greatly in the research necessary to perfect this new type model.

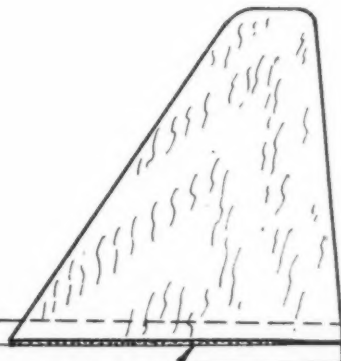




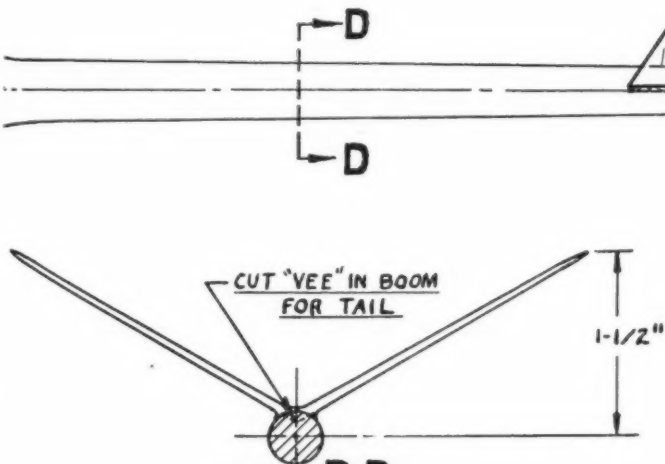
EXPLODED VIEW
OF MAJOR ASSEMBLY PARTS



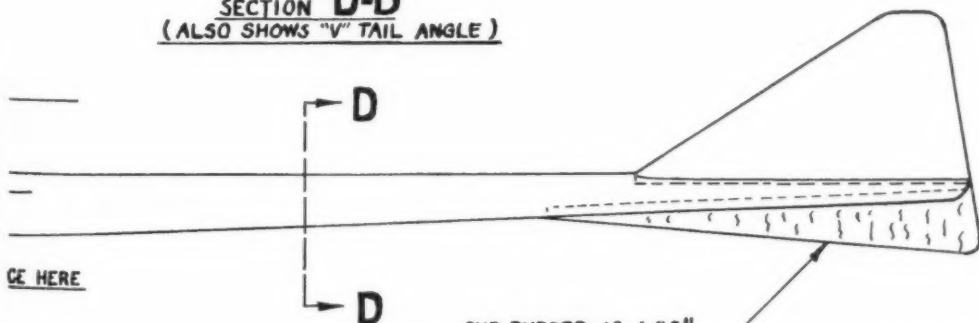
JET TUBE HOUSING
MAKE FROM 1/16" SHEET
BALSA



STABILIZER-RUDDER: TRUE SIZE.
MAKE 2 - FROM 1/16"
SHEET BALSA



SECTION D-D
(ALSO SHOWS "V" TAIL ANGLE)



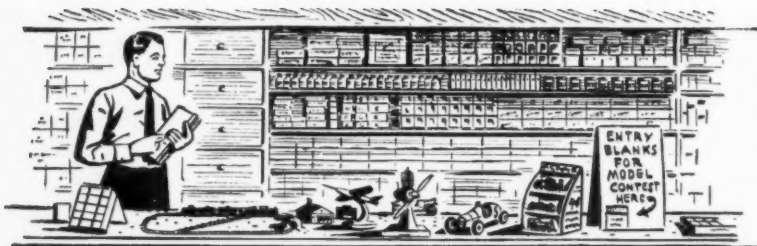
SUB-RUDDER IS 1/16"
SHEET BALSA - IMBED
INTO BOOM 1/16"

"SPEEDJET"

CO₂ RACING MODEL

SCALE: FULL SIZE

DES. BY: ARCH J. HALL



HOBBY COUNTER

Conducted by THE TRADE OBSERVER

"HOBBY COUNTER" is something new in reader service in a "consumer" type magazine. In the opinion of some people, such a service—if it is to mean anything—is an impossibility. But the Trade Observer won't be talking about what is good and what is bad; what we will do is bring you news of new developments, new engines, and kits—some of them before they appear on your dealer's shelves—and the good word about new products, perhaps already advertised and available, but which dealers advise are standouts, meriting special attention. This is the kind of service busy modelers need. With the help of the many well-wishing manufacturers who pitched in to make all this possible—and some of them are amazingly frank about their problems—we shall attempt to give you this service.

Don't jump to the conclusion that the Ohlsson & Rice 29. (Emery at Grande Vista, Los Angeles 23, Calif.), announced January 2, deliveries scheduled February 1, is the same 29 familiar to aircraft builders in 1949. This is a special race car engine, designed to withstand the rugged usage cars receive. O & R's Model Midget car, ready to roll, is tagged, as you know, at \$19.95. Power units purchased separately to equip cars previously delivered without power, can be had for \$13.95, including engine with flywheel, 3-1 ratio planetary gear transmission, fuel tank cover, neoprene line, mounting screws, etc. For added realism, O & R plan deliveries of a true-scale midget driver, ready to put in the driver's seat, for \$1.50 each.

Other O & R recent announcements include O & R Fuel Proofer, impervious to all fuel, to be applied over all types of surface. A 4 oz. can for 45c. Companion item is O & R Fuel Proof Thinner, for varying consistency of the fuelproofer when used in spray guns, etc.

Competition in the engine field in 1950 will be razor sharp with many hot engines in all classes due to make their debut, many as this is written. The fireworks begun by the appearance of the Dooling racing engine in the popular "29" category, and the McCoy 9 in the small engine field will be stepped up with such new jobs as the Hornet .199 and .299, and entirely different Forster B-29 and C-31.

According to Ray Snow, (Hornet Motors, 3849 Ventura Blvd., Fresno, Calif.) makers of the still-going-strong (born in 1940) Hornet, deliveries on the baby Hornet (name is Hornet One-Nine-Nine) were to begin to dealers on February 22 and back orders to be fully caught up with by the end of March. Generally resembling the large Hornet, the .199 has a bore of .656" and a stroke of .590", a double ball-bearing crankshaft, drop-forged dural con rod bushed at both ends, two rings, venturi carburetor, disk type rotary valve. Designed for race cars or planes, the .199 is a quality power plant to sell at \$19.95. Under development is a fuel injection system (\$6 additional cost) which would eliminate "G" trouble in aircraft. Fuel tanks only one-half normal size may be used with this

system, since engine would be "in" through entire flight. Hornet Mite race car for this engine would sell for \$20 (rail car somewhat higher) and combo of the .199 and cable car for \$39.95. Due on or about June 1, price not yet determined, is the new .299 Hornet. A Class B car will be available for this engine.

Due for February 1 shipments to jobbers, both of the new Forster (Lanark, Ill.) engines are entirely different from the popular units in wide use in recent years. None of the parts are interchangeable.

"The new engines are strictly glow plug," says J. R. Forster, "and feature ball bearing crankshaft with extension spool, down draft carburetion, micro adjustment needle valve, new rotary valve, faster timing, aluminum piston with two rings and a high compression head." In keeping with lower price trends both these engines will sell for \$11.75. Forster states that workmanship and material is to their usual standard despite the low price.

ENGINE ROUND-UP: The Morton M-5, beautiful scale five-cylinder four-cycle engine, marketed by Burgess for a time, soon will appear again, this time produced by the M-S Engineering Company, Libertyville, Ill. Production has not begun, but the firm is doing experimental work to develop the engine and, meanwhile, has facilities for complete overhaul and bench testing of units requiring service. Replacement parts are available for prompt shipment. M-S also will produce the companion Waco UPF-7 kit. Sharp-eyed modelers may have noted the M-5 on the February cover . . . Tom Dooling (Dooling Bros., 5452 W. Adams Blvd., Los Angeles 16, Calif.) says he has nothing new, but that the recently announced Dooling 29 is "going to town." Comments from speed fans confirm this. This 29 uses 10" pitch props for speed, 3" to 5" in free flight . . . Johnny Brodbeck, K & B Mfg. Co. (6901 South Eastern Avenue, Bell Gardens, Calif.) passes along a tip on the still almost new .035 Torp Jr. Ships with 200 sq. in. of area, weighing 6 to 8 oz., are proving very successful. In an old .09 ship, 11 oz., 300 sq. in., the Torp Jr. has been averaging from 4 to 6 min. on 20-25 second motor run . . . At the beginning of the year, Gotham Hobby Company (107 East 126th Street, New York 35) had begun factory assembly of its \$2.95 Deezil with new machinery for the job . . . Arnold & Fox Eng. Company (7401 Varna Avenue, North Hollywood, Calif.) added to their .35 the new Fox 29, also at \$11.95, pointing out that the new engine is suited for team racing. The Fox 35 also is improved with higher compression ratio, closer tolerances, improved porting. The 29 was to be ready February 1 or thereabouts . . . As we go to press, news is received of the Anderson Spitfire Flight Timer (Mel Anderson Mfg. Co., 1819 Third Ave., Los Angeles 6, Calif.) Weighs 29/100 of an ounce, suitable for all engines including the babies. This timer features built-in glow fuel shut-off.

Watch for results of those Testor-McCoy (Turn to page 40)

E.T.A.
"29"

POST FREE
\$17



Every British Item Ready for Fast Export.
We Quote Lowest Prices.
SATISFACTION GUARANTEED

MANCHESTER MODEL AERO SALES
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Sickest, handiest, most useful all-metal work bench vise. A work-shop "must" for—
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Include 2% for shipping

Won't mar, mark or dent woods, plastics, metals. No piece too small or too large. 10 Day Money Back Guarantee.
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Important Announcement

THE BRITISH AEROMODELLER

Europe's most popular model journal can now be obtained from your local dealer each month. If you want 68 pages of up-to-date, 100% modelling material, then this is the mag for you. See for yourself! Send today for free sample copy to our sole American agents.

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3 Popular Sizes
New 1950

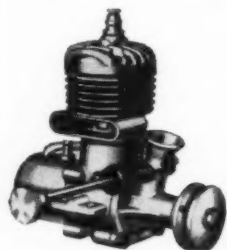
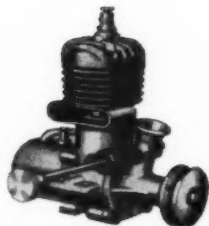
FRONT ROTOR SPORT ENGINES

McCOY "9" - "19" - "29"
for the Testor-McCoy program

McCOY "9"

A duplicate in miniature, this little engine is the REAL McCoy, built to the same precision standard as its bigger brothers. The IDEAL Engine for the novice to easily and quickly learn to fly U-Control and Free Flight with small planes.

Complete with integral gas tank **\$795**



McCOY "19"

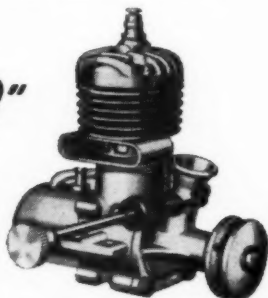
America's largest selling model engine. NOW, further improved for longer lasting, more dependable power. Hardened steel sleeves, trouble-free front rotor. Ball bearing crankshaft.

Complete with integral gas tank **\$895**

McCOY "29"

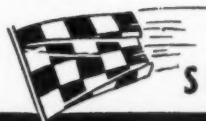
The all-around Class B engine at the popular price of a Class A. Hardened steel sleeves, trouble-free front rotor. Ball bearing crankshaft.

Complete with integral gas tank **\$995**



The Front Rotor type McCOY Engine line was developed to supply the younger amateur modeler with an easy starting, long lasting, dependable power plant. Guided by our own experience in building over 300,000 McCOY Engines and the recommendations of the world's greatest testing ground — the active model enthusiasts of America, these new McCOY's incorporate all the latest improvements for Free Flight, Control Line, Team Racing and P.A.A. events. We are proud to present these NEW McCOY's to the Model World and happy to be able to offer the finest engines we have ever built at new low popular prices.

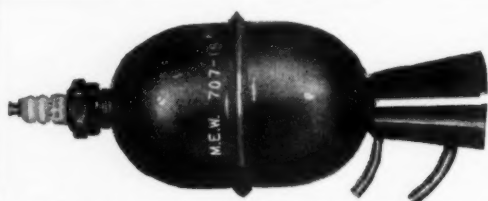
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M. E. W. 707 ROCKET ENGINE

Type: Rocket, intermittent cycle

Size: 1.75" Diam. x 4" Long

Weight: 2 oz. Thrust: 2 oz.

Operating Temp: 900° F.

Fuel: Gasoline and Compressed Air

Continuous ignition and duration.



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Get this really EASY-TO-BUILD scale model of the stripped down, souped up "T" Rod. Even youngsters can put it together quickly. Simplified parts, mostly ready-shaped, with instructions—packed in an attractive box for only 60c a kit. Get yours today!



Famous ACE "T" ROD KIT No. 3R

tie-in advertisements. Average builder may not catch the significance of these ads, but they are admitted a sign of growth in our industry. In the full scale industry it has long been customary for engine and plane builders to get together on their advertising with the result that certain planes are always thought of in connection with certain power plants, or vice versa. Technical magazines sometimes carry dozens of ads saying that "our brakes, or tires, or instruments, are used in the new So-And-So Plushliner." Immediate significance of Testor-McCoy tie-up is that builder won't use wrong engine in a kit so advertised. Policy is interesting innovation in the traditional broad recommendation (sometimes much too broad) of engine sizes, with brands un-named.

Big news from Ed Manulkin, Sterling Models (406 Vine St., Philadelphia 33, Pa.) is revolutionary ready-to-fly free flight and/or pylon gas-powered or CO2 powered Hawk. Span is 27" and there are four parts which the manufacturer says can be assembled in about 10 secs. The Hawk comes with an already-mounted universal motor mount, to take engines from .02 to .074 without drilling for crankcase holes. Self-tapping metal screws permit screwing the engine in place in about a half minute. (Double the time for we fumblerers, and it still sounds good.) For round-the-pylon, a nail is driven in the end of a broom stick, with 30-40' fishline from nail to eyelet already in wing. The ready-to-fly Hawk will sell for \$1.50 and trade announcements were to be made February 1.

Bill Effinger, Berkeley, (142 Greenpoint Ave., Brooklyn 22, N. Y.) advises firm in process of kitting junior team racers. Suggests rules for 60 sq. in. maximum of wing, with top displacement of .099. Among many irons in fire at Berkeley is a new Citizens Band radio unit which, when ready, will include an easily portable transmitter per-

mitting fliers to chase models; also a radio control construction set for D-E Aero-Trol, complete for less than \$20.00. This goes a long way to breaking down price barriers. Some of the new items include the Mini-Zilch for .02 to .049 engines, prefabricated stunt control model at \$1.25; Senor Puddle-jumper, trainer stunt kit for .074 to .23 engines, at \$1.95; two 25-foot lines to-a-card .004 control line wire, at 35c; the family of pressurized gas tanks; and polyethylene lightweight fuel line, which is said not to harden or dry out, selling at 15c a foot.

Boat fans are going for the Scientific (113 Monroe St., Newark, N. J.) Buckeye Jr. Priced at \$3.95, it features fully carved hull, brass flywheel, rubber universal coupling, hardware, brass propeller, shaft and housing, gas tank material, flag, decals, etc. For small bore engines . . . At Comet: (129 West 29th St., Chicago 16, Ill.) new T-16 Taylorcraft, \$2.95 control line kit, completely prefabricated with finished balsa wing, ready cut fuselage sides and formers, one piece formed landing gear, shaped balsa tail pieces and ply firewall. Span is 35½". Suitable for A, B, and small C engines . . . Expected for February deliveries was a Class B Hell Razor. Class D Hell Razor (see Dec. '49 M.A.N.) holds record at 159.23. In the opinion of Art Hasselbach, Consolidated Model Engineering (3087 Third Ave., New York 56) the firm has hit on one of the most important ideas in speed flying, both from the standpoint of speed and safety. The Hell Razor kits feature cast magnesium alloy bottom shells to which the engine bolts, eliminating most of the vibration which sometimes has caused wood jobs to disintegrate. Further advantage is that shell tends to absorb heat from engine, permitting hotter fuels. Hell Razor bottom shells at \$2.95 are in demand among speed demons.

Received just at press time from Herkimer Tool & Model Works, Inc. (204 Harter St., Herkimer, N. Y.), is announcement of new OK glow fuel for miniature engines. The fuel is designed for top performance of the OK Cu band all OK engines. The new glow fuel, developed in the company laboratory, is a scientifically compounded methanol base fuel, heavily fortified with nitrates with proper lubricating ingredients added. While specifically designed for OK engines, this new fuel will also give high performance with other make engines having a similar compression ratio. Most engines fall within this category.

RANDOM NOTES: From W. L. Baker, California Model Company (Long Beach, Calif.), news of aluminum Half-A props (somewhat resemble the ones that came on the Infant) made from .040-24 SO material, soft to take bends, the .040 for strength and low weight. Priced at 15c these props should be a boon to the beginner who often is discouraged by breaking props before getting a flight . . . From Marty Johannes, Mart-Lee, (Van Nuys, Calif.) muffler makers. New retail prices, as of February 1, were \$1.50 for Class A; \$1.95 for Class BCD Shorty; \$1.95 for Model M. CD; \$2.25 for Class CD deluxe. Standard AB discontinued, deluxe CD to be discontinued. Trend shows interest in smaller muffler and less silencing . . . For ½ A team racing, the DeBolt (Williamsville, N. Y.) Speedster, a 12" 36 sq. in., 4 oz. job flown on 26' lines. For .049 to .099, it is being well received . . . Midget glow plug fuel, by Francisco Laboratories, (3787 Griffith View Dr., Los Angeles, Calif.) makers of Powermist. Called Infant Thimble Glow, packaged in pint and 8 oz. cans. This fuel combines 16 different components: 2 nitrates, 2 alcohols, 6 chemicals, de-gummed castor oil, 2 ingredients to counteract throat irritation from exhaust fumes, and 3 inhibiting solvents to prevent deterioration and engine wear as a result of aldehyde formation, curdling or souring. Specially adapted to Arden, Cub, Infant, McCoy, 9 and Baby Spitfires. Sounds impressive . . . Motoys (11 West 42nd St., New York 18) has been shipping their new

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Supermite miniature electric motor which is powered by flashlight batteries. Weighs less than 20 oz., about the size of book of matches . . . Lar-Lin Multi-Purpose Knife, (Lar-Lin Products, 2338 15th Ave., Rockford, Ill.) is four-in-one tool (single edge blade, double edge blade, screwdriver, chisel) with handy clip for carrying in pocket. Light aluminum case, retractable blades. \$1 . . . Hi-Drive dry-cell powered miniature electric motor, by Specialty Battery Co. (Madison 3, Wisc.) Operates on 1½ to 6 volts . . . Modelers will welcome announcement by American Hobby Specialties (2635-45 So. Wabash Ave., Chicago 16, Ill.) of price reduction effective March 1 on the complete line of *Power Props* and *Top-Flite* props; sizes 6" and under will be 20c, 7"-10" will be 25c, and 11"-14" will sell for 30c. An entire new group of props 6" dia. and under, in both lines, have been developed for use with ½A engines.

In early February, at the Model Industry Association show in Chicago, Jim Walker (A-J Aircraft Co., 1166 N. E. 31st Ave., Portland 12, Ore.) announced a ready-to-fly U-control model. This is a profile design with plastic canopy, all fuelproofed, and including handle and lines. The second ready-to-fly item in this column this month, the American Junior item is another indication that complete prefabrication is not necessarily the end of the development road. Walker's most difficult achievement for 1950, however, is a coin-sized gadget, shown at last year's New Year toy show to industry visitors, but under continued development until now. This is the fuel regulator which would eliminate the problem of starting an engine "rich," hoping that it will "come in" properly or of richening up in the air. Big stumbling block was a simple diaphragm, due to the swelling action produced by glow fuels. Several companies gave up on the problem. Finally, by paying experimental costs, A-J was able to secure diaphragms that work suitably with all but a few fuels.

The regulator is packaged in an envelope. The pressure tank, which is an elongated balloon-type tank, closely resembles a miniature hot water bottle. The tank is placed between two pieces of plywood, which, when wrapped with rubber bands, supply fuel under pressure to the regulator. Perfect carburetion is insured at any speed in all flight maneuvers.

America's Hobby Center's (156 West 22nd St., New York 11) recent catalog is interesting to old-time model builders for its illustrated list of kits. Small sketches of dozens of jobs of this and recent years amount to a history of modern modeling. A very clever idea . . . Bill Bishop, (Wm. Bishop Co., 3223 Burton Ave., Burbank, Calif.) now producing all manner of unmodel-like items, from tooth paste to food tenderizers; nevertheless, has three cements, one of them for model airplane use, and known as *Meteor Cement* . . . We see by Testor's trade literature that this company now has 29 dope colors! Shades like chocolate brown, lemon yellow. (Reminds us of Howard Johnson ice creams. Who has the most varieties?) Few builders have any concept of Testor ramifications. Hot fuel-proof finishes (*STA*) which come in colors, railroad lacquers, cements (including special type for planking and sheet covering), solid, free flight, control line kits, propellers, wheels, thrust buttons, microfilm, wire, finishing paper, rubber lubricant, are representative of the varied line of the Rockford, Ill. firm.

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ALL NEW "BABY ACE"



Check these features

ONLY THE SCIENTIFIC BABY ACE HAS THEM ALL!

- ✓ Genuine carved balsa fuselage, finished inside and out. Not band sawn or molded, requires only light sanding before assembly.
- ✓ Complete hardware including bellcrank, horn, formed landing gear, wheels, wire, washers, screws, control-line guides, etc.
- ✓ Finished Scientific Stunt Wing. Airfoiled top and bottom for inverted and stunt flying. Notched for tank, and drilled for novel bellcrank mounting.
- ✓ Kit includes two plastic Pilot Heads, die cut brass gas tank material and tubing, control handle and decals.
- ✓ Die cut balsa tail surfaces. Die cut plywood firewall with E-Z landing gear mounting. Die cut bright aluminum cowling easily attached.
- ✓ Designed especially for Small Bore Engines by one of America's top-notch model builders. An excellent performer, that's actually simple to build. Featuring Jim Walker's U-Control, the Baby Ace can execute any acrobatic maneuver like a scared jack-rabbit.

CLASS ½A 18" WINGSPAN 5" CHORD

\$ 3.50

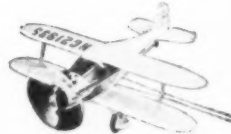
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DYNAMIC
A-B 26" Wing—\$3.50



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NEW 1950 CLASS A MODEL
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High Performance Contest Model
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**MARINE MODELS
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AIRPLANES, ETC.**

Use 410M Thinner Only
Ask your dealer

DRIES Dust Free IN 5 MINUTES

Design Forum

(Continued from page 24)

take-off and first burst of power. (AUTHOR'S NOTE: Positive stabilizer, about 1°, cures nosing up under power.)

"The one change I thought that I wouldn't like was from single to twin rudders, but this too has proved to be an improvement. The end plate effect of the twin rudders makes the stabilizer much more effective. With a limited stabilizer area required in Wakefield models, this increase in efficiency is a big help. With the old-style stabilizer, the cabin model at times developed stalls that continued clear to the ground. In the new model any stall that may develop smooths out after one or two circles and does not build up into severe oscillations. (AUTHOR'S NOTE: More camber on stabilizer helps to reduce this stalling effect.)

"The wing remains the same on the new model. I use the NACA 4612, suggested by Bill Winter, and find that is an excellent airfoil, particularly because of its ability to "hang" without stalling. Average time of three flights December 11, 1949, in 40° weather, 3 min., 41 secs., 850 turns in rubber.

"This new design really has a skyrocket climb, and maintains its climb throughout entire power run (about 60 secs.). The glide is very slightly faster than the cabin model but sinking speed is much less. A two-bladed folding prop 17 1/4" long is now used on both cabin and new model. The flight pattern of the new model is right in climb and glide; no thrust offset at all; right rudder tab only."

Fig. 1 shows the general configuration of the model with approximate dimensions. Some of these dimensions had to be assumed, such as the wing chord, because Mr. Wood failed to mention them. Mr. Wood asks several questions in connection with his design, which may bring out some helpful points.

QUESTION 1. In Wakefield type models, does a long model like mine have any advantage over relatively short coupled models other than increased rubber length?

ANSWER: It creates a condition which may be an advantage under certain conditions. This is to be decided by the model designer himself and depends upon other factors of design. First of all, a long model usually has a long tail moment arm. With any given difference in angle between the stabilizer and the wing, a long tail moment arm reduces the tendency to nose-up sharply under power, the arc of the nosing-up flight path is of lesser degree when the tail moment arm is long. In respect to the nosing-up effect, lengthening the moment arm has the same effect as reducing the difference in angle between the wing and stabilizer. However, it has the added advantage of retaining the longitudinally stable effect of this difference in angle. The nosing-up effect may be reduced by decreasing this difference in angle without increasing the moment arm, but then longitudinal stability, or shall we say—the recovery moment, is reduced. The effect of these factors is especially noticeable at the stalling point while climbing.

Another advantage of the long fuselage is that the tail surfaces can be smaller for any given degree of stability. If the moment arm is lengthened and the tail areas are kept the same, longitudinal and directional stability will be increased. However, when doing this it is wise not to increase the directional stability because any given fin area at a greater distance from the center of gravity moves the C.L.A. rearward and creates excessive "nosing-in" tendency while turning and banking. In other words, it increases the tendency of the nose to drop. So, if you lengthen the moment arm, in any event be sure to reduce the fin area proportionally.

QUESTION 2. Does a long-nosed model require a different center of gravity position as compared to a short-nosed model?

ANSWER: The center of gravity position is not dependent aerodynamically upon the length of the nose. It is dependent upon the area of the stabilizer relative to the wing area, the angular setting of the stabilizer relative to the wing and the position of

the wing and other parts relative to the thrust line. All of these factors influence the trim and attitude of the model in flight. The C.G. is the opposing force and all must work together to provide proper flight trim. Invariably the larger the stabilizer compared to the wing, with any given difference in angle between the wing and stabilizer, the farther back the C.G. may be located, and the greater is the variation in its position that can be tolerated without effecting the flight balance. In other words, large stabilizers (or long moment arms) make a model less critical in longitudinal balance. They also reduce the stalling tendency at maximum climbing angle. Large stabilizers induce recovery from a stall more quickly than small ones. We venture to say, that the improved flight of Mr. Wood's second model chiefly results from its more effective stabilizer and long moment arm. At the stalling point it provides greater nosing-down moment for any given amount of area, because the twin fins, acting as tip plates, prevent air spill from the stabilizer tips. Thus the stabilizer does not stall before the wing.

QUESTION 3. Am I correct in assuming that downthrust tends to kill the climb?

ANSWER: Downthrust does not tend to kill the climb, it tends to kill the stall. By killing the stall, it increases the climb and duration, because no power and time is lost by the necessity for recovery from a stall, before effective climbing is resumed. The reason for this is that downthrust creates a condition where the thrust line is above the center of gravity, or is at least higher in respect to the center of gravity than with no downthrust. Fig. 2. This high thrust line, with the center of gravity below it, creates a righting or nosing-down couple at the point where a model with normal thrust line would stall. During climb there is a nosing-over couple produced between the resultant force R, of thrust and lift, and weight W, which reaches a maximum as the propeller starts to slip. This is indicated by curved arrow at R. When the model slows down at the point of stall, this actually pulls the nose down so the model resumes flight without stalling. You will note in Fig. 2, with downthrust, the wing and stabilizer are at a positive angle to the thrust line T-T. So in effect, the stabilizer is a lifting stabilizer regardless of its angle relative to the fuselage axis, because the model flies with the fuselage axis A inclined upward to the line of flight when downthrust is used.

QUESTION 4. When increasing incidence to correct nose low tendency, is it best to raise the wing's leading edge or the stabilizer's trailing edge?

ANSWER: In our experience it is better to raise the wing's leading edge. If the stabilizer's trailing edge is raised the result will be a sharp nosing-up tendency during power flight, with a sharp nosing-down tendency during the glide, A, Fig. 3. If you wish to reduce the nosing-up tendency under power and increase the nosing-up tendency while gliding, in order to obtain a flatter glide and lower sinking velocity, simply increase the angle of the stabilizer and the wing equal amounts. This will result in flight path B, Fig. 3. In any event the difference in angle between the wing and stabilizer should be not less than 2 1/2°. In fact, 3° will usually give better results.

Mr. Wood asks if we have any suggested changes in his design. Our answer is—very few if any; he has done a marvelous job. However, we have a few suggestions that he might try out and determine whether or not they improve the flight of his model.

First, set the wing at plus 1° angle of incidence, measured relative to the thrust line, and change the stabilizer angle to minus 1 1/2° instead of using minus 2 1/2°. After testing the ship and determining results raise the wing incidence to 2°, leaving the stabilizer at minus 1 1/2°. In the first case, the wing may have to be moved forward approximately 1/2" in order to retain the same steep angle of climb. In other words, the center of gravity must be 1/2" further back relative to the wing center of lift. This will be due to the greater wing angle and lifting effect of the stabilizer

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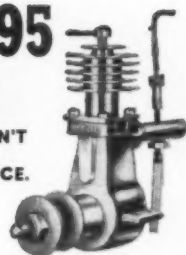
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during climb. Any stalling tendency during climb should be reduced with this combination and the glide should be flatter and longer. Fig. 3A shows the flight path when a high wing and excessive negative stabilizer angle is used. Fig. 3B shows the flight path with lower line of resistance (due to lower wing) and more positive stabilizer angle. (Downthrust has the same effect.)

If it is found that these settings improve the flight, we suggest a third trial with the wing at plus 2° and the stabilizer at minus 1°. Another suggestion is that you equip your model with a vertical fin extending downward beneath the fuselage as in Fig. 4, with the landing wheel mounted in the lower tip of the fin. This, of course, eliminates and replaces the present landing gear and bulge like housing beneath the fuselage. We believe that the fin, though of a cross section equal to the old housing, will give less drag and at the same time will increase the steadiness of flight still more. With this fin, it may be possible also to fly with neutral rudder or even left rudder. At any rate, we are positive that stability will be improved and therefore also the steadiness of flight and duration.

Mr. Wood has produced an exceptional design and we hope sincerely that it will bear fruit in future Wakefield Contests. We hope that he will write and let us know of the results obtained with the fin beneath the fuselage as suggested. With this fin it may be necessary to add area to the tail fins. This can be determined during trial flights.

We have other letters from Mr. Edwin A. Durkee, Mr. George Wucivic, Mr. William F. Gwynne, Mr. George Henry Harrison, Mr. Henry R. Jex, and others. We will cover their questions in future issues. Especially do we appreciate Mr. Jex's remarks on the Reynold's number. We will discuss his comments when we have more space to do them justice.

Don't forget to send your questions and opinions to "Design Forum."

Report from the West

(Continued from page 6)

a Class D hand launch, and is starting a 1/2 A job. Thanks for the letter, Bob.

Our friend Carl Stokes just wrote us a small book. Boy, can that guy write—it takes him five or six pages just to get started! All the boys around Seattle must be Wakefield happy; Carl writes that everyone is building one. He just finished his, but the snow is too deep to do any testing. Carl seems to think that Chuck Wood, who is a very sharp boy at rubber, has the best flying Wakefield in the area. (We said the snow was too deep; you know that we can't be talking about California, boys!)

Carl and the other fellows around there seem to be pleased with the engine classes set up by AMA for free flight gas. Just a few months ago Carl bought a 1949 Chevy and in his letter has gone into detail how he can improve it so he will have a faster car than even the 1950 Chevys. Whether he spends \$500 to hop-up his Chevy or not, he plans to make a trip to Southern California to see all the old gang.

Your West Coast reporter would like to thank all of you that sent the swell Christmas Cards and puzzles. Yes, puzzles. The most unique card was received from the Robbers' family of Oakland, Calif. It came in a bag and you had to put it together like a jig saw puzzle. Lots of fun!

Thanks for all the letters commending us; we hope those readers who asked for ideas and information received satisfactory answers. John Crumley and his son (of Marshallville, Ohio) started speed flying just last year and have been corresponding with your reporter. We are expecting to hear some good reports about the Crumleys. That Junior free flight whiz, Larry Erickson of Omaha, Nebraska, is branching out this year and plans to fly events other than free flight—maybe even speed. We received a nice letter from Robert More, of Bethlehem, Pa. We sure like the looks of Bob's speed jobs; he does about the nicest job of anyone we know. Thanks again for the letters, fellows.

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PAA-Load Event

(Continued from page 13)

requirements are incorporated by reference into the requirements for PAA-Load Event. The special additional rules simply require that the model fly with payload, and the type and amount of payload are specified.

The load for Class A models consists of a dummy "occupant" which must have a "body" at least 3" x 3" x 1" surmounted by a "head," at least 1" x 1" x 1". He must weigh at least 8 oz. He can be made of any material, at the option of the contestant. He must not be essential to the operation of the model (except for balance purposes).

For Class B models, two such "occupants" are required, each weighing at least 8 oz. for a total of at least 1 lb.

Usually the dummy is cut from balsa wood and loaded with solder, shot or other heavy material to bring it to the correct weight. In practice, contestants invariably produce occupants which exactly meet the specifications for size, and weigh exactly 8 oz. No excess baggage for our modelers!

It is not necessary that the dummy be provided with a face, coat and vest, flower in button hole or other embellishments, but most of the "occupants" seen in contests have such refinements. They have no bearing on the outcome, but it's fun to make the little guys attractive or humorous.

The rules do not specify how the dummy is to be made secure within the airplane. Obviously, however, you don't want your occupant banging around inside the fuselage to jar something loose. Some contestants provide grooves an inch wide into which the dummy or dummies fit snugly. Others use pins or brads to fasten them securely to the structure. Others accomplish the same with a rubber band.

It is required, however, that the occupants have visibility forward and to either side. This is a further phase of similarity with full scale flying—an airplane's crew members require visibility and it is essential for the passengers, also.

Finally, it is required that the dummy face forward. This particular requirement has been specifically written into the rules for 1950, and is the only change introduced this year. Actually it is not a change—it was always intended that the dummy face forward, but the 1949 rules were not completely clear on this point, so it was necessary for judges to accept models in which dummies had been placed with the narrow edge facing forward. Such models will not meet the requirements this year. They are not realistic—the pilot of a full scale airplane never sits facing the side window. More important, however, was the matter of clarifying the rule so that all would understand it, and start from scratch on the same basis.

That's about it, men. These remarks are being set down on paper some weeks prior to publication, and at a time when details of prizes, contest dates and locations for 1950 still are mainly tentative. It is definite that the PAA-Load Event will be included at the Nationals. There will be a number of regional PAA-Load contests, one of which will be at the big Mirror Model Flying Fair on Long Island, June 11.

PAA-Load events are also scheduled definitely for the Detroit Exchange Club Meet (June 24-25) and the Junior National Air Races, to be held at Cleveland early in July. Negotiations are underway with contest official in the following Cities: Boston, Chicago, Houston, Miami, Oakland, San Diego, and Washington, D. C. By the time this article appears in print, a complete schedule should be available, and you can obtain a copy of the rules and specifications, schedule of contests, and other information by writing to Educational Director, Pan American World Airways, 28-19 Bridge Plaza North, Long Island City 1, New York.

Let us hear from you, and best of luck in PAA-Load flying this summer.

(EDITOR'S NOTE: Mr. Gardner has offered to stage a control line PAA-Load event at the 1950 Nationals in Dallas, if ten or more modelers write him requesting it. Send your request to him at the above address. If enough requests are received, the event will be announced in the pages of MODEL AIRPLANE NEWS.)



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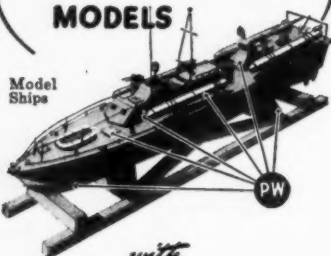
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Martin XB-51

(Continued from page 21)

attack having been delegated to a slightly modified fighter, the metamorphosis of the type was clear and there was no alternative for the Air Force but to strike the name "attack" from its list of design categories and, in 1943, the word was replaced by "bombardment, light." But the "A" letter continued to be used, under its new meaning, until 1945, when it was changed to the more realistic "bomber, tactical." Still the "A" persisted until May, 1948, when the Air Force decided that the lowly attack plane had now grown to full bomber size and, deciding to call a spade a spade, the Air Force dropped the letter entirely.

When that decision was made, however, the Air Force had four new experimental airplanes under construction and development: the Douglas XA-42, the Curtiss XA-43, the Convair XA-44, and the Martin XA-45, the last three jet-propelled attack planes. The Douglas XA-42, with its 10,000-lb. bomb load, had already outgrown all semblance of attack classification, and its designation had been switched to XB-42 (purely a coincidence of numbers, the B-42 being the next available number) in 1944.

The Curtiss XA-43, with its high-performance and light bomb load, was redesignated the XF-87 and it finally emerged in March, 1948, as a four-jet "all-weather" 600-mph fighter, the *Blackhawk*. The Convair XA-44, a radical design with swept-forward wing, fared less well. It was redesignated the XB-53 and ultimately cancelled. This left one airplane, the Martin XA-45, which has finally emerged as the Martin XB-51, our "Plane of the Month," which also is featured on this month's cover.

It is against this background of a progressive historic and technical change in the attack plane category that much of the design difficulty of the XB-51 is made clear. It started life as one thing, it emerged as another, and nothing is more difficult to the design engineer than such a sweeping change in his objectives during the course of a single assignment. It can fairly be said that Martin engineers have never been given a clear idea by the Air Force of the specific requirements for the airplane they were designing. As a result, like Topsy, the XB-51 "just grewed" over a period of four years, complicated by the continuing emergence of new aerodynamic ideas.

The basic requirements for a tactical bomber, in the order of their importance, are: high speed at low altitude, heavy forward armament, and an adequate bomb load. These are, of course, generalities to enable the designer to exercise as much discretion as practicable in its design. The basic Martin design ideas, which were to be integrated into these basic tactical requirements, included: wing sweep, a bicycle landing gear and good low-speed stability. By mixing up these six ingredients and shaking well, the Air Force-Martin team have produced the XB-51 tactical bomber.

Much of the design compromise of the XB-51 centered about the use of the bicycle landing gear, which was pioneered many years ago on an Air Force training plane, later tested on a modified Martin B-26 (facetiously dubbed the "Middle River Stump Jumper") and incorporated on the Boeing XB-47 and Martin XB-48 bombers. The principal advantage of this gear arrangement is the fact that it leaves the wings entirely clear both of the drag and, more importantly, the heavy structural load of landing shocks. With this problem out of the way, Boeing engineers proceeded to suspend their six jet engines in nacelles from the wings, whereas Martin engineers dispensed with wing mounting altogether and placed all of the engines on the fuselage. This arrangement left the wing completely and utterly free of any installations whatsoever.

It was by design and not by accident that the XB-51 wing is wholly unimpeded: Martin engineers wanted to use variable incidence on that wing! Incidence is the angle between the wing chord line and the fuselage horizontal reference line; that is, it is

an angle usually built-in to an airplane to permit the fuselage to fly level while the wing is at the angle-of-attack selected for the cruise condition. If this angle were zero (i.e., no incidence) the airplane fuselage would have to be inclined slightly upward in flight so that the wing could obtain the required lift. But because this angle is usually fixed, the airplane must lower its tail in order to take off and land at the slowest possible speed. It has been argued for nearly a quarter-century that the ideal arrangement is one that would permit in-flight adjustments of this incidence angle. Only the structural problem has prevented its wide use heretofore.

The first practical variable-incidence wing was used on a Cornelius *Fre-Wing* civil airplane in 1933. George Cornelius continued his private experiments with variable-incidence on his *Mallard* personal airplane and on the XFG-1 bomber fuel glider developed for the Air Force (MODEL AIRPLANE NEWS, April, 1946, issue). In addition to the XB-51, variable-incidence is also used on the Republic XF-91 jet interceptor, now undergoing test at Edwards Air Force Base, Murco, Calif.

Unlike the conventional tricycle landing-gear airplane, the XB-51 cannot move through a longitudinal angle on the ground: its bicycle landing gear keeps its fuselage at a set angle to the runway. Therefore, when the take-off is made, the wing is set at a high incidence angle, which gives the wing a high angle-of-attack and, therefore, high lift. Once in the air, the incidence angle is lowered to only 1 or 2° for high-speed flight. On final approach to a landing, the incidence is again increased to a high value to produce the high lift necessary for a slow-speed landing. In addition, the device may be used in flight as, for example, during a low pass over enemy troops. When the pilot desires to pull up he increases the incidence angle, together with the conventional method of pulling back on the stick, and the effect is to make the plane climb like an express elevator for a short period. Variable incidence does not increase the rate-of-climb of the airplane over a long climb, say from take-off to 40,000', but by providing a sudden increase in lift it "blossoms" the airplane up for several thousand feet, much like a bomber following a salvo release of its entire bomb load.

Martin engineers incorporated a number of other vary-modern aerodynamic devices to the XB-51 wing. Lateral control is by spoiler panels rather than by aileron. For example, when it is desired to roll (or bank) to the right, the panel on the right wing is raised, thereby "spoiling" the lift over part of that wing, causing it to drop and the plane to execute a right roll, bank or turn. This is exactly the action produced by a conventional aileron. The advantage of the spoiler system is that the spoiler panels may be placed forward on the wing and they require comparatively little space, thereby leaving the wing trailing edge entirely free for full-span flaps, which are essential for high-speed airplanes. Unfortunately, spoilers do not push back on the stick as they are extended; i.e., there is little or no "feel" to the pilot, so that it is difficult for him to know how much spoiler he is applying. To solve this problem, tiny conventional ailerons are placed at the wingtip trailing edge, not to control the airplane, but merely to provide a "feel" in the system for the pilot. This device was first used on the Vought OS2U *Kingfisher* Navy scout plane and on the Northrop P-61 *Black Widow* night fighter (MODEL AIRPLANE NEWS, October, 1944).

The remaining question in the XB-51 design was where to put the engines. They could not be located on the wing because of its variable-camber feature for several reasons: much heavier wing structure would have been required to take the engine weight and the thrust loads, operation of the wing would have varied the angle between the air intake and the airstream resulting in thrust losses, etc. They could not be located in the forward fuselage because of the heavy armament load, the

(Turn to page 48)

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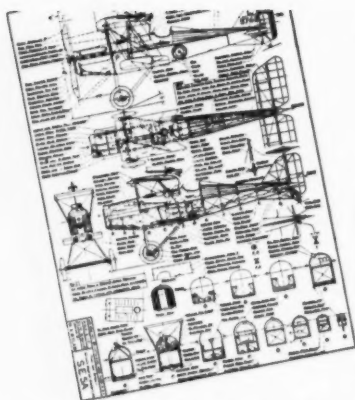
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presence of the forward main landing gear unit and the bomb bay compartment. As a result, they were simply hung on the outside, like a forgotten toy. This external mount arrangement, however, had a precedent in the Nazi Junkers Ju 287, a peculiar swept-forward jet bomber, which approximated the XB-51 in size and weight. Location of the third jet engine in the tail of the XB-51 was a routine engineering problem with the exception of the air intake arrangement, in the design of which great care was exercised to minimize pressure losses in the various bends and twists of the air inlet duct.

Final problem was location of the horizontal tail. The conventional location operates in the wake of the wing downwash to create a stabilizing effect on the airplane. With the variable-incidence wing of the XB-51, however, this wake intensity, velocity and direction undergoes very large changes, which could not be easily handled by a conventional tail location. As a result, the horizontal tail was mounted atop the vertical fin, completely clear of any downwash influence from the wing. This arrangement was pioneered in the Curtiss XF15C Navy combination jet and piston engine fighter (MODEL AIRPLANE NEWS, October, 1947).

Numerous tough design problems, therefore, were presented in the XB-51, most of them the result of solutions to others. However, by borrowing features from a variety of other aircraft and incorporating a number of original contributions to aircraft design, The Glenn L. Martin Company has produced a light, fast, and deadly tactical bomber. Its nose-mounted eight 20 mm. cannon provide a potent blast at enemy troops, pill-boxes and artillery installations. Its 10,000-lb. bomb load provides a heavy barrage when required. And its 600 mph top speed makes it a fleeting target at low altitude, one rendered doubly difficult to get a bead on by its skyrocket climb at the end of its pass. It is not a large airplane for such use; its span is only 55', it is 80' long, and stands 17' high. It weighs only about 22 tons and this light weight, together with the 15,000 lbs. of thrust from its three General Electric J-47 turbo-jet engines, is responsible for its terrific speed.

The first of two prototype XB-51 bombers made its initial test flight October 22, 1949, when Martin chief test pilot flew the strange plane from Middle River, Md. (near Baltimore), to Naval Air Test Center, Patuxent River, Md. The second airplane is scheduled to join the first in the test flight program shortly. At this writing the future of the XB-51 is not clear. As mentioned earlier, it is the fast, single-seat fighter plane that has rapidly assumed the responsibilities of ground cooperation duties and latest in the series is the Republic F-84E jet fighter, now in quantity production as a low-level attack ship. It would appear, therefore, that the XB-51 design, which has never been clearly focused, has been caught in an evolution of tactical requirements that may have passed it by. But it represents the ingenuity of the aeronautical engineer in avoiding the impasses of design problems and providing suitable solutions. And the XB-51 will provide important technical data to the USAF Air Materiel Command on one of the most unorthodox aircraft configurations yet flown.

Baby Toots

(Continued from page 25)

ments. Use both downthrust and right-thrust until a smooth, stall-free right circle climb is attained. Added power may now be used.

It is extremely important to break in the motor before maximum power is used. A good break-in period consists of winding the motor in increasing ten-turn increments until 500 to 600 turns have been reached. From here on in—go gradually. It is a good policy never to go beyond 800 turns. Always remember that it pays to take good care of your motor, washing it after a day's flight, sprinkling with talcum powder and keeping in a cool, dark place until you are ready to use it again.

Wakefield Winner

(Continued from page 11)

the following two points: 1. It must fly steadily; and 2. Be easy to build (thus also easy to repair). In my opinion, these are the main characteristics of a good contest plane. Very often a streamliner does not meet these requirements, which I think are most important. The construction of the model is plain enough and needs perhaps no explanation. Some comments about the outward features may, however, be necessary.

The fuselage is a slab-sided of a bit larger size than is common nowadays. It is comparatively high but narrow, as it has a double motor. Therefore, the longerons are strong $5/32"$ sq. balsa, but the corners of the fuselage are rounded off after construction. The very closely placed spacing struts are $5/32" \times 1/16"$ balsa. The fuselage has a separate tail portion on which the fin and stabilizer are mounted. The tail portion is fixed to the fuselage laterally by tongues on the fuselage and vertically by the projecting portions of the fin. Rubber bands, which engage hooks, hold the tail unit in position. The drive gears are placed between the fuselage and the tail unit.

The central fin is extraordinarily large, but we remember that the fuselage is also a big one, and therefore a smaller fin cannot ensure satisfactory directional stability for the model, as the original smaller fin proved.

The stabilizer has the maximum permissible area. Its high aspect-ratio is conspicuous. During original planning, the deciding factor was not aspect ratio, but—according to my theory—the length of the stabilizer compared with the length of the propeller. The parallel chord stabilizer is fitted with small end-plates in order to eliminate the tip vortices and, in this way, to gain maximum efficiency.

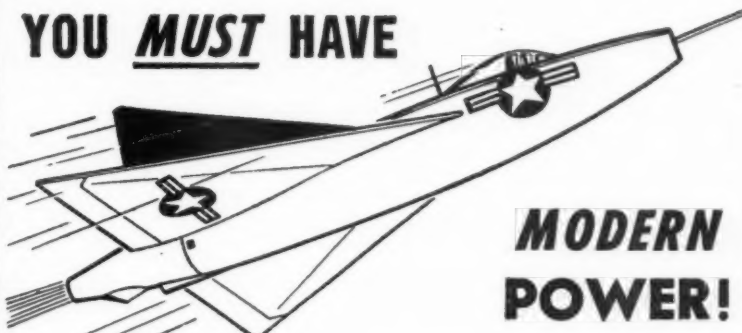
The parallel chord wing with elliptical plan has a somewhat modified RAF 32 section, and a high aspect-ratio. The upper and lower surfaces of the leading edge are planked with $1/32"$ balsa sheet to a distance of $13/16"$ from the leading edge. This balsa covering forms the main stiffening of the wing. In addition to this, there is a leading edge $3/32"$ sq., a single spar $5/16" \times 3/32"$, and a trailing edge of $3/8" \times 1/8"$ balsa. All the ribs are of $1/16"$ balsa sheet. The wing has a $3"$ center section on which the wings are set to a plain dihedral of $2\frac{1}{4}^\circ$. The wing is reinforced only by two wire pins on the upper surface of the trailing edge in order to prevent the rubber band (which is crossed over the wing and goes around the fuselage, keeping the wing in position) from breaking the wing. The wing itself is placed on a ramp of $3/16"$ balsa on the top of the fuselage. This ramp assures the correct angle of incidence, if the wing is moved. The balsa arc on the upper side of the fuselage was installed only to increase the cross section of the fuselage in order to meet the rules, as the fuselage is now longer than the original design.

The landing gear is made of piano wire and is of orthodox design. It is held in place by two rubber bands, going around the legs and holding them in their retaining tubes.

The wheels are of 1 mm. ply, reinforced by discs of the same ply on each side. A hub is formed by a short length of aluminum tube.

The most conspicuous point of the plane, as compared with present designs, is the double motor. Two motors are coupled by two drive gears situated at the tail end of the fuselage. One of the motors turns the propeller and the other is anchored on the lower piece of the two-piece nose block. The purpose of this arrangement is to allow the use of a large amount of rubber, and was resorted to only because we Scandinavians were not satisfied with the extra long motor at the time the model was built. We call the two gears at the tail end "kraks-kraks," as the gadget turns in short bursts and creates a very distinctive noise. In my opinion, the only weakness of the "kraks-kraks" is the weight—which has an unfavorable influence on the position of the center of gravity.

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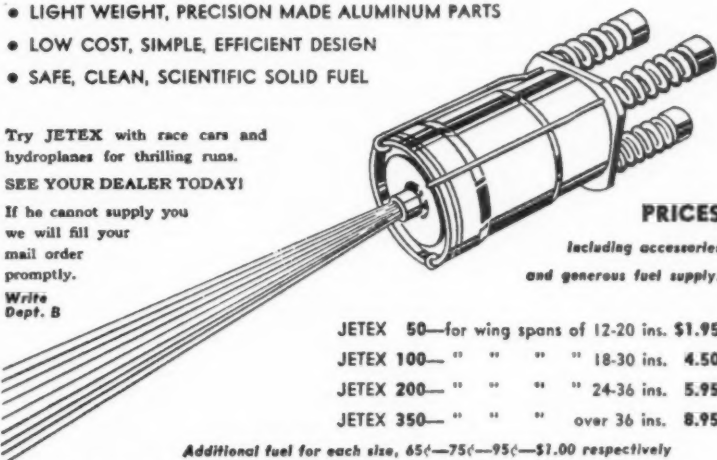
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Winding is carried out by locking the gears with a wire pin and then by stretching the two motors. First, the lower one, and then the upper one, both in the orthodox manner and in the same direction. When the same number of turns has been wound on each motor, it is easy to remove the pin and the ship is ready for flight. Both motors are 14 strands of $1/4" \times 1/24"$ Dunlop rubber with a total weight of $4\frac{1}{2}$ oz. During the contest, 1,200 turns were used, giving a motor run of 65-70 secs.

The construction of the "kraks-kraks" transfer gadget is comparatively simple. First a balsa and 1 mm. ply block is made. The balsa part fits into the end opening of the fuselage, and the ply prevents the block from slipping through. A strip of brass plate is inserted through the block and is bent around it. The two free ends of the strip are fixed by pricking them from both sides into one end of the block as shown in the drawing. After this, the two holes

for the axles are drilled. The gears are $11/16"$ in diameter and $1/16"$ thick, but gears a bit bigger would improve the operation.

The propeller is relatively small, the diameter being $16"$ and pitch $22"$. Compared with the propellers of up-to-date models it is indeed small, but this prop makes the plane easy to fly, and she is a climber—even though very heavy. According to my theory mentioned previously the model requires a short propeller, to prevent the stabilizer from getting too long and weak. The width of the propeller blade is $1-11/16"$ and the thickness $1/8"$ at the same point. The propeller shaft is of 2 mm. piano wire. Small brass plates are used for fixing the bearings in the nose block and propeller. The bearings are short lengths of brass tube, and they are fastened in holes in the brass plates by soldering.

The motor hooks are of the type very often found in the Northern countries, the

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1/32x1/8	1/4¢	1/8x1/2	1/32x2	8¢	
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8x7/8x1-3/16... 6c	1-3/4 24c	18x1-3/4x2 32c
10x1x1-1/2 10c		
12x1x1-1/2 12c	9x1-1/2x2 15c	Glider Wing
14x1-3/16x1-3/4	10x1 3/4x2 20c	Section

Cone Cement 186 10x1-1/2/2K2 .20c 3X3/16X20 .10c
 Comet tube cement 10c
 Clear Dope 10c
 Colored Dope 1 oz. 10c; 2 oz. 20c; 8 oz. 50c
 Red, Orange, Yellow, Green, Lt. Blue, Metallic Red, Black, White 1 oz. 10c; 2 oz. 20c; 8 oz. 65c
 Music wire 3 ft. 10c; 20 ft. 30c; 30 ft. 40c; 40 ft. 45c
 Silkspan, White 10c; 30c sheet; GM. 10c; 3 for 25c
 G-M Tissue, Red, White, Yellow, Blue 10c; 3 for 25c
 T-56 rubber, per ft. 1/32, 1/8, 1/4, 3/16, 1/2, 5/8, 3/4, 1 1/4, 2 1/4, 3 1/4, 4 1/4, 5 1/4, 6 1/4, 7 1/4, 8 1/4, 9 1/4, 10 1/4, 11 1/4, 12 1/4, 13 1/4, 14 1/4, 15 1/4, 16 1/4, 17 1/4, 18 1/4, 19 1/4, 20 1/4, 21 1/4, 22 1/4, 23 1/4, 24 1/4, 25 1/4, 26 1/4, 27 1/4, 28 1/4, 29 1/4, 30 1/4, 31 1/4, 32 1/4, 33 1/4, 34 1/4, 35 1/4, 36 1/4, 37 1/4, 38 1/4, 39 1/4, 40 1/4, 41 1/4, 42 1/4, 43 1/4, 44 1/4, 45 1/4, 46 1/4, 47 1/4, 48 1/4, 49 1/4, 50 1/4, 51 1/4, 52 1/4, 53 1/4, 54 1/4, 55 1/4, 56 1/4, 57 1/4, 58 1/4, 59 1/4, 60 1/4, 61 1/4, 62 1/4, 63 1/4, 64 1/4, 65 1/4, 66 1/4, 67 1/4, 68 1/4, 69 1/4, 70 1/4, 71 1/4, 72 1/4, 73 1/4, 74 1/4, 75 1/4, 76 1/4, 77 1/4, 78 1/4, 79 1/4, 80 1/4, 81 1/4, 82 1/4, 83 1/4, 84 1/4, 85 1/4, 86 1/4, 87 1/4, 88 1/4, 89 1/4, 90 1/4, 91 1/4, 92 1/4, 93 1/4, 94 1/4, 95 1/4, 96 1/4, 97 1/4, 98 1/4, 99 1/4, 100 1/4
 Alum tubing, per ft. 1/32, 1/8, 1/4, 3/16, 1/2, 5/8, 3/4, 1 1/4, 2 1/4, 3 1/4, 4 1/4, 5 1/4, 6 1/4, 7 1/4, 8 1/4, 9 1/4, 10 1/4, 11 1/4, 12 1/4, 13 1/4, 14 1/4, 15 1/4, 16 1/4, 17 1/4, 18 1/4, 19 1/4, 20 1/4, 21 1/4, 22 1/4, 23 1/4, 24 1/4, 25 1/4, 26 1/4, 27 1/4, 28 1/4, 29 1/4, 30 1/4, 31 1/4, 32 1/4, 33 1/4, 34 1/4, 35 1/4, 36 1/4, 37 1/4, 38 1/4, 39 1/4, 40 1/4, 41 1/4, 42 1/4, 43 1/4, 44 1/4, 45 1/4, 46 1/4, 47 1/4, 48 1/4, 49 1/4, 50 1/4, 51 1/4, 52 1/4, 53 1/4, 54 1/4, 55 1/4, 56 1/4, 57 1/4, 58 1/4, 59 1/4, 60 1/4, 61 1/4, 62 1/4, 63 1/4, 64 1/4, 65 1/4, 66 1/4, 67 1/4, 68 1/4, 69 1/4, 70 1/4, 71 1/4, 72 1/4, 73 1/4, 74 1/4, 75 1/4, 76 1/4, 77 1/4, 78 1/4, 79 1/4, 80 1/4, 81 1/4, 82 1/4, 83 1/4, 84 1/4, 85 1/4, 86 1/4, 87 1/4, 88 1/4, 89 1/4, 90 1/4, 91 1/4, 92 1/4, 93 1/4, 94 1/4, 95 1/4, 96 1/4, 97 1/4, 98 1/4, 99 1/4, 100 1/4
 Plywood 6x12; 1/16; 1/32; 1/8; 3/16; 1/4; 1/2; 5/8; 3/4; 1 1/4; 2 1/4; 3 1/4; 4 1/4; 5 1/4; 6 1/4; 7 1/4; 8 1/4; 9 1/4; 10 1/4; 11 1/4; 12 1/4; 13 1/4; 14 1/4; 15 1/4; 16 1/4; 17 1/4; 18 1/4; 19 1/4; 20 1/4; 21 1/4; 22 1/4; 23 1/4; 24 1/4; 25 1/4; 26 1/4; 27 1/4; 28 1/4; 29 1/4; 30 1/4; 31 1/4; 32 1/4; 33 1/4; 34 1/4; 35 1/4; 36 1/4; 37 1/4; 38 1/4; 39 1/4; 40 1/4; 41 1/4; 42 1/4; 43 1/4; 44 1/4; 45 1/4; 46 1/4; 47 1/4; 48 1/4; 49 1/4; 50 1/4; 51 1/4; 52 1/4; 53 1/4; 54 1/4; 55 1/4; 56 1/4; 57 1/4; 58 1/4; 59 1/4; 60 1/4; 61 1/4; 62 1/4; 63 1/4; 64 1/4; 65 1/4; 66 1/4; 67 1/4; 68 1/4; 69 1/4; 70 1/4; 71 1/4; 72 1/4; 73 1/4; 74 1/4; 75 1/4; 76 1/4; 77 1/4; 78 1/4; 79 1/4; 80 1/4; 81 1/4; 82 1/4; 83 1/4; 84 1/4; 85 1/4; 86 1/4; 87 1/4; 88 1/4; 89 1/4; 90 1/4; 91 1/4; 92 1/4; 93 1/4; 94 1/4; 95 1/4; 96 1/4; 97 1/4; 98 1/4; 99 1/4; 100 1/4
 Testor carved blade propellers 12", 14", 16" dia. 50c each
 Jasco rubber 1/32, 1/8, 1/4, 3/16, 1/2, 5/8, 3/4, 1 1/4, 2 1/4, 3 1/4, 4 1/4, 5 1/4, 6 1/4, 7 1/4, 8 1/4, 9 1/4, 10 1/4, 11 1/4, 12 1/4, 13 1/4, 14 1/4, 15 1/4, 16 1/4, 17 1/4, 18 1/4, 19 1/4, 20 1/4, 21 1/4, 22 1/4, 23 1/4, 24 1/4, 25 1/4, 26 1/4, 27 1/4, 28 1/4, 29 1/4, 30 1/4, 31 1/4, 32 1/4, 33 1/4, 34 1/4, 35 1/4, 36 1/4, 37 1/4, 38 1/4, 39 1/4, 40 1/4, 41 1/4, 42 1/4, 43 1/4, 44 1/4, 45 1/4, 46 1/4, 47 1/4, 48 1/4, 49 1/4, 50 1/4, 51 1/4, 52 1/4, 53 1/4, 54 1/4, 55 1/4, 56 1/4, 57 1/4, 58 1/4, 59 1/4, 60 1/4, 61 1/4, 62 1/4, 63 1/4, 64 1/4, 65 1/4, 66 1/4, 67 1/4, 68 1/4, 69 1/4, 70 1/4, 71 1/4, 72 1/4, 73 1/4, 74 1/4, 75 1/4, 76 1/4, 77 1/4, 78 1/4, 79 1/4, 80 1/4, 81 1/4, 82 1/4, 83 1/4, 84 1/4, 85 1/4, 86 1/4, 87 1/4, 88 1/4, 89 1/4, 90 1/4, 91 1/4, 92 1/4, 93 1/4, 94 1/4, 95 1/4, 96 1/4, 97 1/4, 98 1/4, 99 1/4, 100 1/4
 Large face bushings, 3/8", 7/8", eyelet 1/16X1/8, 3c
 Precision rings 20c each
 Precision 1/32, 1/8, 1/4, 3/16, 1/2, 5/8, 3/4, 1 1/4, 2 1/4, 3 1/4, 4 1/4, 5 1/4, 6 1/4, 7 1/4, 8 1/4, 9 1/4, 10 1/4, 11 1/4, 12 1/4, 13 1/4, 14 1/4, 15 1/4, 16 1/4, 17 1/4, 18 1/4, 19 1/4, 20 1/4, 21 1/4, 22 1/4, 23 1/4, 24 1/4, 25 1/4, 26 1/4, 27 1/4, 28 1/4, 29 1/4, 30 1/4, 31 1/4, 32 1/4, 33 1/4, 34 1/4, 35 1/4, 36 1/4, 37 1/4, 38 1/4, 39 1/4, 40 1/4, 41 1/4, 42 1/4, 43 1/4, 44 1/4, 45 1/4, 46 1/4, 47 1/4, 48

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so called "S" hooks; the end of the hook is bent into the form of an S, looking along the shaft center line. With this form of hook, the rubber can't creep around the hook when the motor is wound up. The style of hook has been used in the Northern countries for about 15 years, and has fully met the most stringent demands. Generally, thin rubber tubing is used on the hook to protect the motor rubber from chafing.

A close examination of the drawing will show that the angle of incidence of the wing is about 6° , and that of the stabilizer about 3° , so that the difference between the two angles is about 3° . The center of gravity is situated 80% back from the leading edge of the wing. It has been proved by adjustment that a smaller difference between these two angles will not do, as a tendency to dive appears. The propeller turns in a vertical plane adjusted 3° to the right from the center line in order to eliminate the considerable torque reaction. The fin is also adjusted for a right-hand turn, so that the model is in a constant right turn from start to finish.

It is to be hoped that MODEL AIRPLANE News readers will have learned some valuable pointers from this description, and that we will meet many of you in Finland this summer at the 1950 Wakefield meet.

World War I

(Continued from page 32)

A detailed examination of the Fokker triplane's wings revealed that the depth of the airfoil was an unprecedented 4.95 in. for a chord of 33 3/4 in. Rib webs made of thin three-ply were one-piece—from nose to trailing edge—with a rectangular cut-out for the spar, and several circular lightening holes. Cap strips on the upper and lower web surfaces also were continuous the full chord. Narrow strips of three-ply were glued to the webs at various places to increase compression strength.

Spar construction was as unusual as the over-all design. These members were identical in all three wings and took the form of a horizontal rectangle when viewed in cross section. This rectangle was 7.9" long and 4" high. Now in each corner of this rectangle, imagine if you can, a strip of spruce with a cross section 2.1" wide and .625" high, each running the full span of the wing. The inner edges of these four spanwise members were attached to a vertical spanwise three-ply web which, combined with the forward and aft outside spanwise flanges of three-ply formed a very strong box section 3.7" apart. These two beams were held in place by top and bottom spanwise three-ply coverings. This huge member was, in effect, composed of two closely located box spars made into one large member by applying spanwise plywood top and bottom coverings.

The dimensions given above applied to the central portion of the Fokker triplane spar, dimensions of the components varying toward the wing tips. The four spanwise spruce members varied from 2.1" dimension given above to about $\frac{3}{4}$ " at the tip. Their depth, however, remained .625" throughout. The outer plywood covering of the spar was reinforced in the center half of each member by an additional three-ply layer glued on, making, in effect, a six-ply covering at that point.

The only other spanwise members were a spruce stringer about $\frac{3}{4}$ " square located $\frac{1}{4}$ " from the trailing edge and a leading edge of three-ply wrapped around the nose contour of the airfoil. The spruce stringer acted as an aileron hinge attaching member in the upper wing.

Ribs were attached to the spars by merely sliding them into place, but were held in position by small triangular section blocks of wood tacked to the spars. All three wings were identical in chord but varied in span: upper, 22' 2", not including overhang of airfoil balance—8" on each side; middle, 20' 4 1/2"; lower, 18' 6 1/2", and were made in one piece. Trailing edges were wire, including the ailerons. Aileron frames were made of steel tubing.

As can be seen in the photographs, the upper wings were attached to the upper

fuselage longerons by an inverted "V" strut assembly, splayed outward when viewed from the front. These "center section" struts were braced with steel cable. The middle wing was attached directly to fittings bolted to the upper longerons, and the lower wing to the lower longerons.

Standardization of fittings for these purposes was remarkable. In each case, two channel-sectioned steel stampings were attached to the front and rear faces of the wing spar. At the bottom (or top as the case might have been) was welded an internally threaded lug through which was screwed a bolt attached to the fuselage or strut fittings. A lock nut was provided to permit a certain amount of adjustment of angle of incidence.

Interplane strut fittings were secured to the spars in the same manner. A thin steel shoe wrapped around the end of each strut was attached to the above-mentioned channel sectioned stampings by means of a long tubular bolt.

Wing tips were made from rejected ribs, their lower surfaces cut flat, and attached to the tip rib with gussets. The lower wingtips were equipped with ash skids for protection in case of a rough landing, but were usually removed when the triplanes reached operational squadrons.

FUSELAGE. Here, Fokker reverted to his belief in using the best material for the job consistent with ease of production. As was the case with his early models, steel tubing was used throughout the fuselage structure. The frame consisted of four longerons varying in diameter from 3" in the forward section, 7" in the middle section, and 6½" in the tail. Uprights and cross members closely followed the dimensions of the longerons to which they were attached. Assembly was by butt welding, frowned upon in those days in cases where the weld worked under tension, as it apparently did in the Fokker Dr. I.

The upper longerons were straight to the rear of the cockpit, where the 7 1/2" dia. tube was spliced in, then dropped slightly in line to the rear fuselage back, the line was broken and dropped sharply to accommodate the horizontal stabilizer and the tubing spliced to a still smaller size. Lower longerons were run straight back, parallel to the upper members to provide a floorboard for the cockpit and lower wing anchorage. The curved side elevation in this area was provided by a light understructure of tubing containing a cut-out well into which the lower wing spar fitted.

Quadrants of steel tubing were welded across the angles formed by the various fuselage members. Through these quadrants were looped steel bracing wires, tensioned on one side by a turnbuckle.

A fuselage fairing was extremely simple. Low, lagging farmer at the rear of the cockpit held the forward portion of the tapering plywood coaming which flattened out and ended at the stabilizer. The circular section of the rotary engine was preserved only on the sides and top by a tubular ring bolted in place. Upper fuselage contour back to the cockpit was in the form of an aluminum covering, easily removable for access to the engine and ammunition boxes. Fuselage sides were faired by a triangular shaped plywood cover attached by aluminum clips.

Cockpit of the Fokker triplane was somewhat smaller than that of the average German pursuit. The seat was attached to two uprights and was adjustable for height. Conventional flight controls were used. Engine controls were located on a quadrant at the pilot's left, but otherwise instrumentation was spotty and incomplete. At best, the Dr. I had an airspeed indicator, an altimeter, a compass, and a fuel gauge to inform the pilot of his progress. There was no instrument board; the indicators were merely attached to convenient structural members.

TAIL ASSEMBLY. Empennage of the Fokker Dr. I was made entirely of steel tubing except for the wooden main stabilizer spar. Elevators and rudder were balanced. A typical comma-shaped Fokker rudder was employed without a vertical fin. Steel tubing was used for the four land-

(Turn to page 32)

(Turn to page 52)

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ing gear struts. Another feature of the Fokker triplane that baffled Allied engineers was the use of a small wing covering the axle. This surface amounted to about 12 sq. ft., and was built around an airfoil section similar to that used in the wings. There is no known calculation of the lift provided, but it was probably substantial—in spite of its low aspect ratio—because of the end-plate effect provided by the landing wheels.

Power plant of the Fokker Dr. I was the Oberursel rotary, rated at 110 hp. and built under a prewar licensing agreement with Le Rhone. Cowling varied between a one-piece spun aluminum version, and a type in which the front surface was a removable plate. In both types, the bottom was left open to prevent exhaust and raw fuel collection, and two air holes were provided on the face to facilitate cooling.

Model changes were made right on the line, or whatever constituted a production line in 1914-18, and were so very insignificant in relation to the complete airplane

that no attempt was made to catalog them. Conditions and the science changed so rapidly in the First War that it was cheaper to bring out an entirely new type than try to re-hash an old one. In addition, the rapid development of aviation had the designers continually bringing out new designs, some of which were nearly obsolete by the time they reached the battle fronts.

So it was with the Fokker Dr. I. Any changes were very minor ones. It is known that at least one Fokker triplane was tested with a Siemens engine, probably of about 160 hp. but whether it was used as a flying test-bed or not, cannot be determined. The often repeated reference to a Fokker Dr. I fitted with a Mercedes 220 hp engine must be discounted because the engine weighed nearly 1,000 lbs.; the triplane empty weighed only 825 lbs.!

But we can be sure of one thing. The Fokker Dr. I proved what has become universally accepted in aviation—the cantilever wing. And it gave the critics a lot to talk about!

Modeling the Cessna 195

(Continued from page 15)

purchased or turned from laminated balsa discs. In either case, they should have bearings cemented to the sides so they will revolve freely and accurately.

Three parts are required for the wing assembly, the right and left panels and the center section. Cut the parts out as indicated, ribs and spars from 1/16" sheet balsa, leading edges and tips from 1/8" sheet, and the trailing edges from 1/4" x 3/8" strips. Assemble the parts over full size layouts and then join all three sections with 1/4" dihedral at each tip. Finally trim the leading and trailing edges to the cross sectional shape indicated.

The horizontal and vertical tails are light and strong, if built as suggested. Cut outline pieces from hard 1/16" sheet balsa. Add 1/16" sq. spars and ribs. Lift these flat structures from the jig, and add 1/16" sq. strips to each side of each rib; these are then cut to conform to the streamline rib shape shown by the sketch. To complete the tails, trim and sand the outline pieces to blend with the rib cross section.

Before frames are covered, they must be sanded to permit a neat job. Don't be deceived by the pictures of the structure of the original model; the parts actually should not be assembled until they are covered. First cement cellophane to the side windows. Now the fuselage may be covered. Colored tissue was used on the original and it is both attractive and serviceable. Work carefully, using as many small sections of tissue as is necessary to avoid wrinkles. Attach the individual sections of tissue with banana oil or light dope. When the covering job is done, lightly spray the parts with water to shrink the tissue but do not apply any dope to the covering until the entire model is completely assembled.

To assemble the 195, follow this sequence: first cement the wing to the fuselage making certain that it is correctly aligned. Slip the stabilizer into the notch between formers No. 8 and No. 9. Cement the rudder atop the fuselage, off-setting the leading edge several degrees to the left so the model will glide in right turns. Check the tail surfaces for correct alignment. The whole model may now be given two coats of thin clear dope.

Trimming and minor details complete the construction. The front windshield is light weight celluloid and it is cemented in place. The side window outlines on the test model were realistically represented by cutting them from dark tissue and working the dark tissue into a decorative color scheme. License numbers are likewise cut from dark tissue paper, dummy tail wheel should be added and the main wheels and other external wood parts painted, of course.

To prepare the model for flight, a CO₂ cartridge is slipped into the holder, but before any flights are attempted the position of the center of gravity should be adjusted. When supported by the finger tips under the front spar, the fuselage top should be level. In the event it does not, add weight in the form of small pieces of lead to the extreme nose or tail to attain this attitude. Glides should be smooth descents from shoulder height and any erratic performance should be corrected through further weight redistribution. First power flights should be with reduced power achieved by slightly unscrewing the engine cylinder (1/16 of a turn at a time until power is right), or by simply not launching the model until some of the energy has been exhausted from the cartridge. Minor adjustments may be made by slightly warping the flying surfaces. In the event glides are satisfactory but power flights show a tendency towards stall, tilt the thrust line down slightly by inserting small washers behind the top lugs of the engine mount.

Treat your Cessna model right in building and flying and it will treat you to countless pleasurable experiences.

What About Professionalism?

(Continued from page 14)

from years of building and contest flying; listen to what he has to say.

"Regarding my feelings on professional fliers entering into model competition, I can only state that it can be prevented by a change in present AMA rules to form a new category for these fliers, or by the direct action of the contest directors within the rules of their own contests.

"It has always been Berkeley's policy to buy outstanding designs of well-known model builders and to apply our production methods and engineering experience to them, to produce kits for the general model public that can be made to perform equally as well and even better than the original design.

"Advertisements of flights by professionals in competition, in such a way as to indicate that it is a kit-built model is definitely false advertising, and it is up to the magazines to police their ads to prevent this misrepresentation.

"The entry of these professionals in contests is definitely bad for model building as a whole, as it discourages the entry of the good model builder against the full-time professional.

"I believe a very good example of good sportsmanship is Jim Walker's demonstration flights around the country. I am quite sure that Jim could beat many of the professionals who enter the contests at which he demonstrates. It seems unfair that Jim should hold back while other manufacturers are permitted to fly in competition and win."

If you are not from the Virginia area, you may not know Bill Hinman, but down there he is the idol of the kids. His tireless efforts on the part of model aviation for youth have paid dividends. The Virginia area is a hotbed of model activity. He speaks to us as one who can perhaps observe things a little more clearly since he is not an industry member, or a contest competitor himself.

"Thank you for your invitation to comment on professionalism in model aviation. In order to examine its effect on modeling, the modeling game as it is today should be examined first. It seems proper to me to use these criteria:

1. Who are the modelers?
2. Of what benefit is modeling to our national welfare?
3. Who foots the bill?

On the first question, the boys of America (or perhaps the world) were the first to take a serious interest in modeling. A book, *THE AMERICAN BOY'S WORKSHOP*, and two magazines, *THE AMERICAN BOY* and *THE YOUTH'S COMPANION*, published plans of a twin-pusher monoplane which were built by a great number of boys (I was one of them), prior to 1920. If the boys drop modeling, the game will die. They are the basic force that keeps it alive.

"On the second question, modeling is gaining recognition as one of the strongest, practical educational forces in the world today. To whom is that education useful? One can hardly contend that a man pursuing modeling as a hobby contributes to his effectiveness in a job wholly different in character from modeling, except in the same sense that hunting or fishing, or other similar activity, contributes to his physical well-being. On the other hand, modeling is of great value to boys and young men because it teaches them physics, engineering, and practical mechanics in a way which no amount of class room study can match. It stimulates his interest in aviation, and provides officer material of the best type to the air forces of the Nation. It assures a plentiful supply of engineers and scientists to the airplane industry, and it lays the groundwork for an Army made up of the best technicians the world has ever seen.

"Now take the last question, 'Who foots the bill?' The model game, and with it, the model industry has grown because of the contests. Given the stimulus of contests, modelers buy more engines, planes,

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Every reader of MODEL AIRPLANE NEWS has his own ideas of what should be featured in the magazine. However, few of you ever let us know, so we simply have to guess what will interest the majority of M.A.N. readers. Here's your chance to speak out—just mark your preferences below, clip out this ballot (or copy on another sheet), and rush it to our Editorial Office, at 551 Fifth Avenue, New York 17, N.Y.

1. (a) Do you like full size plane cover paintings, as on this issue?
- (b) Or, do you prefer model plane subjects on the cover?
- 2 Write (1) after feature you like best, (2) for the next, etc. *Cross out* those of no interest.
 - (a) Scrap Box
 - (b) Flash
 - (c) Report From The West
 - (d) Design Forum
 - (e) Plane of the Month
 - (f) Air Ways
 - (g) World War I
 - (h) Club News
 - (i) Hobby Counter
3. (a) What articles other than those listed above did you find of especial interest? (Just jot down page numbers.)
- (b) What articles were of little or no interest? (Page numbers again.)
- (c) What would you have liked us to print in this issue that we didn't include?

and all the other sundries which make the model industry. The industry is thus dependent on the continuation of contests as the life blood of its existence, at least on today's scale of operation. However, these contests which are so important to the model industry, are not paid for by the industry. They are paid for almost entirely by civic organizations, who give large sums of money, and a great deal of time to make the contests possible.

"I believe these are the principal facts of the model game today. There are, of course, many other factors, but they are not of the same order of importance as those I have cited. Now take a look at what happens. When a contest is planned, the major questions are—where will it be held, who is the angel, and who is going to do the work? Here are the usual answers:

Where? At an airport, usually municipal or military, whose administration believes in encouraging model aviation for boys.

The Angel? The V.F.W., The American Legion, the Navy League, the Exchange Clubs and civic organizations, all for the reason that they want to encourage model aviation for boys.

Who does the work? Generally the same groups who put up the money give many hours of their time because they believe in model aviation for boys.

"Now most of these organizations don't know too much about modeling. Few of them object when, in order to limit the number of prizes, the age classes are combined. They don't realize that whenever this is done, the men walk off with the prizes, and the boys for whom the contest was arranged are 'frozen out.' Now allow a few professional entries in this already sorry picture and see if you can stomach the situation.

"Do you think public spirited organizations, and like-minded individuals will continue to pour money and time into the game in order to allow full-time professional modelers to carry home a trunk load of prizes?

"The model industry members must realize that their livelihood depends on the number of boys and young men who can be interested and encouraged in modeling. Why is it some of them will not understand that, by accepting prizes which were intended by the donors for the youth of America, they are discouraging young modelers, and doing the whole model game a lot of harm.

"I think industry should be represented at contests. They should demonstrate or compete; but if they compete, they should compete for record and not for prizes. Let the prizes go to the amateurs, and particularly to the boys where the donors intended them to go.

"I have seen Jim Walker at a number of contests—giving demonstrations. Each time I've seen him, I have applauded heartily.

The next time I see him, I'll do what I've wanted to do before—compliment him on his type of contest performance."

Walt Schroder is known as a model expert of note, an author on model matters, and a steady friend of the young model builder.

"Positions are always awkward; they usually give the impression of a Billy Sunday, and in all cases will remain a skeleton in your closet and will cause much embarrassment from time to time. But the cause of modeling is of such importance at the present, some good may come of all this controversy.

"Professionalism in modeling is the simple development of latent skills to the point where winning is absolutely elemental and detrimental to competitive action.

"To call an individual a professional by virtue of the position he holds, whether a manufacturer or employee of same, smacks of the witch hunting days of old Salem. Being a manufacturer, or its adjunct, cannot give, produce, or improve any of the flying skills. This only mother nature and practice can do.

"A manufacturer, or his cohort, does have one advantage and it is a big one! Namely, the ability to secure first-rate engines. Being an old-time engine manufacturer, I am well aware of those occasional engines with that extra something, and well remember saving them for my friends.

"While there is nothing illegal in these practices, they do impose a terrible handicap on the average builder, who by the way, is the life blood of the model industry. He has to pay for everything he comes by, whereas almost all the experts feel it is their right to be the recipients for free of all their worldly goods—in modeling, that is. I know I am not disclosing any deep, dark secret, but the practice is commonplace; I have benefited innumerable times myself. The return to the manufacturer is tremendous—known results with attendant free publicity and their only cost that of the small piece of merchandise involved.

"Because of the far-reaching possibilities and the real potential harm to modeling, if it hasn't already been done by these shortsighted practices, I feel the industry should try to improve their public relations by not continuing and condoning these practices in the competitive field. Turn contests back to the model builder.

"To harp further, I still feel the utter futility of the occasion when I watched a well-known manufacturer pose for pictures, holding the trophy he had just won. The trophy, incidentally, was donated by himself in the name of his manufacturing concern.

"Another step in the right direction would be to correctly state all the facts when they assist the participant in setting a new AMA record. If the engine and/or kit is supplied gratis, say so. The model builder won't be grieved, he'll just buy more of their products. Let the product supply the good will by winning for the average contestant.

"I repeat, turn back the contests to the average Joe, the guy we all love, the model builder. This is something that has rankled for years. I'm glad to get it off my chest."

Maurice Shoenbrun dares to take up the cudgel and frankly admit he is a professional, BUT!

"Inasmuch as I am a professional modeler of twenty odd years—building, flying and designing model airplanes—I am greatly pleased to have the opportunity of sounding off on the controversial subject of professionalism.

"I have a sincere interest in modeling and would like to see it grow in popularity. I take my hat off to the various civic organizations, the V.F.W., local youth groups, etc., for their wonderful support of the hobby. Their interest is a healthy one. However, the professional who today plagues the contest field is a decided menace in the sense that he is continually walking off with the prize money, etc.; consequently, discouraging the amateur from the ranks of our fraternity. This condition is an extremely unhealthy one.

Might I first clarify what I consider constitutes a professional:

1. He is one who is in modeling strictly for financial gain, promoting his model business or a concern he represents.
2. One having the models with which he will compete built for him for a price by other model builders. I might add he usually has so many models he couldn't lose if he decided to.
3. Those who have manufacturers feeding them supplies, engines, money, etc., for the benefit of the manufacturer.

"I recall an incident which will give an example of what I consider professionalism. At the 1940 National Model Meet in Chicago, I recall seeing a prominent modeler come racing onto the field in the closing minutes of the contest with a free flight model. He followed, draped by about 30-odd stooges who bowed and curtsied at his every whim. They started his motor (which, incidentally, was plenty hopped up), scattered themselves to the four winds in order to immediately retrieve his model and return it for its second flight. At least half of these assistants were in the employ of the 'X Model Airplane Company,' as was the master. Luckily for the competitors, the model crashed upon take-off.

"Is this not professionalism? Conditions such as I have cited put the amateur at a handicap. This is not an isolated case; I've seen it happen hundreds of times throughout the years. I recall a year or two ago, sitting in the office of a prominent diesel engine manufacturer and seeing four models which were built and delivered by a cohort for a coming contest . . . and on and on it goes.

"I myself am a professional in the sense that I have written numerous articles on model aircraft for publication; however, this is my only offense. Of the other aforementioned offenses, I am *not* guilty.

"Should a special classification be set up either to have the professional compete against the professional only, or to limit the professional to compete for recognition only, and with the consent of the contest director? Perhaps a minimum number of contestants must enter an event in order for the professional to even compete. I myself should be glad to comply.

"I feel that this or similar arrangements for holding contests would be best and in the interest of all for these reasons:

1. The amateur will not be plagued by the aforementioned situation in Chicago, and similar incidents. He can feel assured that if he is a better modeler and has the better model, he will come out on top without material and physical advantages.
2. On the other side of the picture, let us assume the professional will compete in his own class; he will be forced to think, design, fly, and build more keenly than ever in order to survive. By doing this, his new developments and designs will be an asset to all those connected with modeling."

Our anonymous expert prefers to hide his name, yet refuses to stay quiet on the model building professional subject.

"I've been associated with the model hobby for close to twenty years. I've watched the rubber model give place to gas, I've seen free flight take a back seat for U-control and a lot of things happen in an ever growing hobby. Lately, it has been my misfortune to see an ugly newcomer appear on the scene—the fellow who makes his living from the model contest-goer, and yet competes against him for prizes the amateur might otherwise win. I've seen his carload-lots of models appear at contest after contest. I've seen him slowly, and unfortunately imperceptibly, strangling the model hobby. I've seen him take the candy from the baby's mouth.

"He has a lot of excuses. He's helping sell his product. He's 'teaching' the young builder. He's 'testing' his product. Don't you believe it! He's actively competing and taking prizes meant for the average model builder.

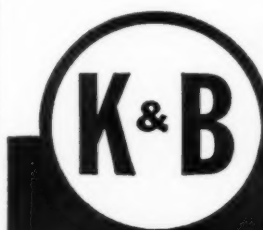
"If he did this fairly, and without special advantages we might be less aroused. The professional will deny what I say now, but I have seen these things happen, I have

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been on the inside and know whereof I speak. Won't you meet a few of my expert friends?

"Meet Mr. A. He was an engine manufacturer. He didn't have time to build the ships he flew, so he had them built for him. However, he had time to compete and take the prizes in violation of AMA rules.

"Meet Mr. B. He has a kit manufacturing company. He appears at all major contests with a trackload of ships. Actually! I can't say if he builds all these models himself, but I doubt it. (Know anyone who has over 20 models all complete with engines and ready to fly and all of which he built with his own hands?) His engines are all the best—he gets them from manufacturers who know he can win, and who like the promotion possibilities of more wins. And, don't let anyone tell you they aren't better than those you can buy in your hobby shop. I know; I have given him engines!

"Meet Mr. C. He worked for an engine manufacturer, who paid Mr. C's way to the

Nationals. He got in over four hours of flying every day of the week for months before the Nats, the engine maker supplying him with custom built models. P.S. He won first place, of course!

"We could work our way through the alphabet, and then back again. And don't think we have not been guilty, too. We sat by and watched all this happen, we observed a lot—but said nothing. Ours has been a sin of omission, rather than commission.

"We've seen trophies donated by large manufacturers, by the V.F.W., the Navy League, Plymouth Car dealers, and all sorts of civic-minded agencies, go to the 'Pro.' Somehow I think, they were meant for Mr. Average Builder. For the young lads who may someday be the backbone of the Air Force, who have taken up the nation's outstanding hobby for the fun of it. For the kick they get when they win a prize. Come on Mr. Pro, play fair!"

Well, that about covers the "con" side of

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our discussion. The comments of our board might be summarized as follows:

1. Professionals do compete unfairly.
2. Advantages are open to the pro, and he uses them.
3. Some revision should be made in the rules, and a separate class formed.
4. The present trend of competition wins going to the professional is hurting the hobby.
5. The professional often violates the rules about building his own models.
6. Something should be done about professionalism; just what seems open to question.
7. Not all industry members compete unfairly, but those who do are giving all members of the industry a black name.
8. Civic bodies do not intend prizes to go to the pro, but to young amateurs.

There it is, the opposition to professional competition. Now you have heard both sides of the issue. Next month there will be no forum. In the June issue, however, we shall feature an analysis of the reactions of the model builder himself. Wouldn't you like to do your part, take your place as a member of our forum? Here's your chance.

Give us the answers to the questionnaire printed here—then sit back and watch for your opinions to appear in the "Model Airplane News Open Forum."

"Professional Forum" Questionnaire

In the belief that the model builders themselves would like to take part in this forum, we are printing this questionnaire. If you would like to express your opinion, here is your chance. The answers to this questionnaire will form the third part of this series of three articles. We will accurately tabulate the answers given, and should have the facts to settle this controversial issue, once and for all.

1. As a model builder, do you find the professional competition an advantage to you, or does it cause you to make out more poorly in contests?
2. Are you content to participate against the professionals, or would you rather see them in a separate class?
3. Do you feel more friendly towards the professionals who do not compete against you, or who do not accept prizes than to those who do?
4. Would you be for, or against, a ruling prohibiting the professionals from active competition?
5. Do you feel the definition we have set up for a professional is fair?
6. Have you had any particular experience in a contest with a professional? Any brief details?

If you want to take part in this interesting forum, write down the answers to the questionnaire and mail them to:

The Editor, MODEL AIRPLANE NEWS, 551 Fifth Avenue, New York 17, New York.

Your answers are important! You are the model builders.

Please give us your name; it will not be published if you request us to withhold it.

Mail answers no later than March 20, 1950!

Air Ways

(Continued from page 29)

manual has just been published by the AMA, called "Model Airplane Club and Chapter Manual." It was prepared to aid those interested in forming and running model airplane clubs in their own communities, and contains information on organization, programs, and activities. This manual is available without charge, and should be of great help not only to those desiring to form a club, but to many clubs already in existence. Copies may be secured from

the Academy of Model Aeronautics, 102 Connecticut Avenue, N. W., Washington 1, D. C.

THE 1950 NATIONALS, as mentioned in our flash, page 1 of the March issue, will be held at a Naval Base, located a few miles from Dallas, Texas. It is believed that the indoor section of the meet will be run off in Ft. Worth, which is also nearby. The time will be the week of July 24.

The joint sponsors will be the Navy and the Exchange Clubs; while the Navy has been connected with the Nats for the past two years, through sponsoring two excellent meets at its Olathe, Kansas, Base, this is the first time the Exchange Clubs have been involved in the big event in some years. They were sponsors of the 1939 Nationals in Detroit, from all accounts a bang-up affair.

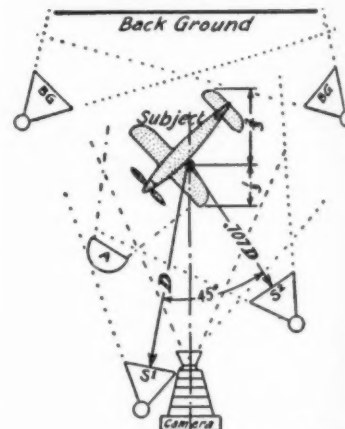
The AMA has long tried to get some national group to join in on the Nationals on a continuous basis, not just from year to year. It appears that the Exchange Club, through its national setup, will do this. The Exchange, of course, is no stranger to model aviation, as local Exchange Clubs have given continuous support to model groups throughout the country. We believe, in fact, that this civic organization has done more to foster model aviation than any other national group.

WAKEFIELD PLANS seem to be fairly complete, and it is to be hoped that the schedule already worked out can be completed early enough so that the usual last-minute rush will not be evident this year. Finland is a long way off, and it will take some intensive preparations to assure that a representative team can be sent over from the U. S. A. in time for the Finals on July 23.

We are informed by Frank Zaic that Eliminations will be held during the middle two weeks of June (any time during this period, at the discretion of the various Meet Directors) in the following cities: New York, Chicago, Cleveland, Los Angeles, San Francisco, and either Hampton, Va., or Washington, D. C. Preliminary Meets may, of course, be held anywhere else in the country to select the best fliers in other localities, who may then compete in the Regional Eliminations. Regardless of whether or not they were in a Preliminary Meet, however, any modeler may compete in the Regional Meet for his own locality, and registration for this must reach the Regional Directors by May 31.

THE DRAWING which we print below was unavoidably omitted from Part Five of our series of articles on "Model Portraiture," which appeared in the March, 1950, issue. Since this illustration covers many points on the important subject of

(Turn to page 58)



LIGHT LIST - Watts

S1 - Main Subject	- 100
S2 - Second Subject	- 100
BG - Back Ground	- 200
A - Auxiliary (12 or 3)	- 50-60

*2-100s Vertically Spaced

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The Nationals will have the PAA Load Event—also many important regional meets. It is sponsored by Pan American as a challenge to you to build model planes of more realistic character and to fly them in a more practical demonstration of true aviation value than ever before possible in competition.

See summary of rules at right and write for PAA Load Event booklet. (Official rules as approved by Academy of Aeronautics and published in booklet form by PAA will answer any questions you may have.)

Write to Educational Director, 28-19 Bridge Plaza North, Long Island City 1, New York.

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Eligibility: AMA requirements apply and categories are: Combined Junior-Senior (Classes III and II); Open (Class I).

Rules: Official Model Aircraft Regulations for "Gas Models—Free Flight" apply except as noted below:

Classification—R.O.G. only, Classes "A" and "B" only.

Power Loading Requirement—Rule applies without payload.

Payload—The Models shall carry in flight dummy occupants as follows:

- One occupant for Class "A".
- Two occupants for Class "B".

Dummy occupants shall be composed of a "body" at least 3 x 3 x 1 inches surmounted by a head at least 1 x 1 x 1 inches, made of any materials with each occupant weighing at least eight ounces. Except for balance purpose, the occupants shall not be essential to the operation of the model. Contestants must provide their own occupants.

Payload Compartment, the occupants must be carried in an upright position relative to normal flight, facing forward. The "face" is considered to be on the broad side of the occupant. Dummy to be placed within an enclosed compartment providing visibility through transparent areas at least one inch high to the front end to both sides of the heads of the occupants. The occupant must be readily removable from the compartment for checking of weight and measurements.



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lighting a model for photographing, we suggest that it be clipped out and attached to Mr. Rusher's article.

1950 AMA ELECTION RESULTS. Just as we go to press a rush bulletin has been received from AMA headquarters giving the complete list of officers elected for the 1950 term. They are: *President*—Kenneth Held, Detroit, Mich.; *Secretary-Treasurer*—Frank B. Bushey, Hartford, Conn.; *District I Vice President*—Charles H. Hoelck, Mystic, Conn.; *Contest Board*—William Wargo, Bridgeport, Conn.; Henry Struck, Hamburg, Conn.; *District II Vice President*—Frank Zaic, New York, N. Y.; *Contest Board*—Warren Fletcher, Elmhurst, L. I., N. Y.; Andrew Canino, Vineland, N. J.; *District III Vice President*—Harry D. McCall, Cleveland, Ohio; *Contest Board*—Chester Lanzo, Berea, Ohio; Jack Norris, Cleveland, Ohio; *District IV Vice President*—John Young, Hagerstown, Md.; *Contest Board*—W. Harold Bunting, Greensboro, N. C.; William A. Pennoyer, Washington, D. C.; *District V Vice President*—H. R. Hudson, Atlanta, Ga.; *Contest Board*—Milton W. Myers, Jacksonville, Fla.; Charles D. Hudspeth, Jackson, Miss.; *District VI Vice President*—Howard E. Heminger, Rockford, Ill.; *Contest Board*—Dutch Hess, De Kalb, Ill.; Edward Lidgard, South Bend, Ind.; *District VII Vice President*—John R. Kates, Royal Oak, Mich.; *Contest Board*—Claude McCullough, Ottumwa, Iowa; Donald E. Murray, Detroit, Mich.; *District VIII Vice President*—Raymond C. Matthews, Jr., Oklahoma City, Okla.; *Contest Board*—William C. DeLorme, Jr., Ft. Worth, Texas; Raymond C. Matthews, Jr., Oklahoma City, Okla.; *District IX Vice President*—Tie (announcement to follow); *Contest Board*—Corliss St. Clair, Salina, Kansas; Tie (announcement to follow); *District X Vice President*—Harvey S. Robbers, Sr., Oakland, Calif.; *Contest Board*—Richard E. Schumacher, Reseda, Calif.; Andrew G. Petersen, Burbank, Calif.; *District XI Vice President*—Elmer J. Roth, Salem, Oregon; *Contest Board*—Ed Sims, Medford, Oregon; Roy Ellison, Portland,

Oregon.

Our first photograph shows Capt. Richard S. Robinson, USAF (Tachikawa Air Force Base, APO 704, Honshu, Japan) with his P-47 control line model, and at the time the picture was taken, the airplane had made twenty-one flights. The ship is powered by a Forster 99 engine, which pulls it along at an average speed of about 47 mph. The wingspan is 82" and, fully loaded, the plane weighs 15½ lbs. Capt. Robinson notes that since the troop carrier command is not equipped with P-47 type aircraft, he was forced to build his own!

The strange looking craft in picture No. 2 belies its name somewhat, for it has proven to be a very successful flier. This 40" span flying wing was built by Neville Piggott (102 Sask. Cres. W., Saskatoon, Saskatchewan, Canada). It is powered by a McCoy 36 engine, which gives it a speed of approximately 60 mph. The ship carries two fuel tanks—a Maeco stunt tank, and another tank of 1 pt. capacity. Mr. Piggott said that he has built two of these designs and they are extremely stable, giving no trouble whatever in flying.

The jet enthusiasts are represented this month in illustration 3, which shows Brayton Paul (no address given) on the left with his friend, Cosmo Cantore, who is president of the Martin Modelers Club. Mr. Paul was the originator of the design shown, but it took an old jet man like "Tony" Cantore to prove its worth. The latter has won several contests with speeds between 140 and 145 mph. Unfortunately, Mr. Paul has given no other details on these jet planes, but does wish to put in a plug for the Martin Modelers Club. This group was organized in 1946 by the employees of the Glenn L. Martin Company, and they now own a fenced-in three-circle field, complete with concession stand and a P-A system. Activity of the members is very much diversified; some members even go so far as to build their own engines.

A highly successful Wakefield design

dreamed up by Charles R. Wood appears in our fourth snapshot. The airplane is held in the picture by friend Jerry Bloomer and since it is completely described in our "Design Forum" column, we shall not do so here. Mr. Wood, however, does want to mention his fine results with the NACA 4612 airfoil, which has been pioneered by Bill Winter.

J. H. Maxwell (871 Filton Avenue, Filton, Bristol, England), who is no newcomer to the columns of the magazine, sent us picture No. 5 which he considers is a "scale model of a model" since it is a replica of a Powerhouse, reduced in size to fit the Campus 100 engine. The CO2 tank is mounted vertically at the C. G. The wingspan is 15" and the ship weighs 0.56 oz. At the time the photograph was snapped, the model had made a dozen or so flights without any damage whatever, and Mr. Maxwell notes that "for sheer flying fun, it's hard to beat."

A very unusual control line design appears in No. 6. This ship is the work of L. W. Christensen (518 East 134th Street, Hawthorne, California), who states that it was originally built as a pusher flying wing. He found out, however, that his airfoil was incorrect and decided to add the fuselage and tail and make a sport model. In this form the airplane flew quite well; however, it was found that after the engine quit, the model practically dove to the ground, having almost no glide whatsoever. To cure this fault, the "air dams" were added to the wings, and the result was amazing. The ship flew even better under power, and now has a nearly normal glide; in fact, by holding the nose very high, it can be made to land tail first, still with a very reasonable glide. It weighs 1½ lbs. and has a 21" wingspan, with a Torpedo Special engine supplying the power.

No. 7 illustrates a diesel-powered stunt model constructed by Pete Barlow although the picture was sent to us by A. E. Bailey (631 Crewe Road, Wheelock, Sandbach, Cheshire, England). It is powered by an ETA diesel of 29 cu. in., which he believes is about equivalent to our Drone engine. At the time the picture was taken, they had been unable to find out much about the flight characteristics, as considerable trouble was encountered when the engine was mounted on its sides as illustrated. They feel that when this bug is cleared up, performance should be first rate.

The speed team of Jack Albrecht (185 Franklin Street, San Francisco 9, California) and James Paysen had a great deal of success in the Midwest area during the 1948 and 1949 contest seasons. One of their best ships appears in picture 8. This is a Dooling 61 powered original, which gives them a consistent speed of 150 mph plus. Although the ship is shown here equipped with a single-bladed prop, they have generally found that twin-bladed propellers are more satisfactory. The Dooling engine of this model is glow-plug equipped, of course, and a crutch construction has been

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employed. This particular model weighs in at about 24 oz.

Bob Colegrove (Box 213, Belley Branch, Columbus 9, Ohio) is a real radio enthusiast and one of his most successful efforts has been the 10' Cleveland Albatross towline glider which he is holding in our ninth picture. The ship weighs 2 1/4 lbs. and an Aero-Trol receiver is installed, with rudder control only. Bob flies several other radio control ships, including a 540 sq. in. wing area job, powered by a Forster 29; and he has another big job with 1,281 sq. in. This one weighs 7 1/4 lbs. and is powered by an inverted Atwood, which is equipped with a two-speed timer. This particular job has two-channel controls for rudder and elevator. At the time his letter was written, he had plans to tow the Albatross glider aloft with the Atwood-powered job. This should really be a lot of fun!

The free flight model in photo No. 10 was built by D. J. Lea (63 Church Street, Harpurhey, Manchester 9, England) from MODEL AIRPLANE News plans. This is the Ay-Jay and is powered in this case by a Mills diesel of 1.33 cc. capacity. The ship had not been flown when the photo was taken, and Mr. Lea notes that he made a few modifications which include the fitting of twin fins for extra stability, two-wheel landing gear, slightly decreased dihedral, and a much-strengthened fuselage.

Picture 11 proves that Kenneth R. Verthein (Scobey Hall, Box 104, Brookings, South Dakota) likes his ships to look realistic. This slick biplane is actually a stunt ship which has been flown a great deal and found to be fast, stable, and very maneuverable. It has a wingspan of 32" and is powered with a Triumph 49.

That staunch supporter of the Laurel Model Airplane Club, of Laurel, Mississippi, H. Lansford (1015 Second Avenue) sent us our last illustration which shows Ellis Ross holding his glow plug Ohlsson 23 free flight model. Fortunately, the photo was taken before any flights were made, since the airplane, which had a pod and boom type fuselage, was lost on its first flight.

NEWS OF MODELERS

PEN-PAL SEEKERS: Mrdjenovic Jovan, Beograd, Brace Baruh 14, Yugoslavia, mainly interested in radio control . . . Cadet Sin, A. J. D., No. 38 Pilot Course, Officers' Mess, R. A. F. Turnhill, Nr. Market Drayton, Shropshire, England, likes everything to do with model airplanes . . . Richard Momberger, 21 Fuller Terrace, Albany 5, New York, is a 14-year-old who prefers models in the Class B category . . . T. Uchiyama, 13 Dojomonzen, Yamaguchi P. O. Zone, Yamaguchi-ken, Japan, wants to correspond with American model enthusiasts and obtain, if possible, copies of model magazines . . . Gianni Fiorini, Via Castiglione 81, Bologna, Italy.

SPECIAL REQUESTS: Fred Fecht, Highland, Wisconsin, is eager to obtain several World War I planes, both solid and scale models; he wants to purchase them . . . Harry Brown, 643 Perry Street, Gainesville, Georgia, has a McCoy 60 that ran two hours' time and would like to trade it for a Super Cyclone or any other similar engine more suited to stunting . . . James W. Reid, Cardell, Lounsedale Road, Paisley, Scotland, will exchange a subscription for an English model mag equivalent in price to a Berkeley kit of the Minnow.

CLUB NEWS

California

Hal Roth, corresponding secretary of the Thermal Thumbers, apologizes for sending the list of 1950 officers so late. Bob Dagan is president; Lo Salisbury, vice president; Andy Faykun, secretary; and Russ Johnson, treasurer. We quote the following from his letter: "Inasmuch as it has been somewhat of a problem to have adequate officiating at contests, we have offered qualified members paid-up dues for the year, for becoming leader members and contest directors. In the past, for the privilege of doing all the work and suffering all the grief connected with contests, the poor con-

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test director has had the privilege (?) of paying AMA dues of five dollars per year. Our plan doesn't eliminate all the grief of the poor CD, but at least we feel it is a step in the right direction."

Connecticut

It has been brought to our attention that a new organization has been formed in this State at Branford—called the Lucky Seven. An entirely new "idea" in club membership and activity, they are limited to only seven members. The Lucky Sevens are: president, Joe Dzialo; secretary and treasurer, Clement J. DeRocco, and members Ray Backus, William Lambert, Thomas Cimino, Sal Albraccio, Jr., and Joseph Stegna. Our thanks to Charles Hoelck and John Affeldt for sending this information.

Illinois

The results of the eighth yearly election of officers for the Aurora Aeronauts Model Plane Club were received as we go to press.

Harry Kelley is their new president; Ronnie Schwiesow and Owen Richards are junior vice presidents; Sigmund Benewich is contest director; and Ray Armbrust is their field director. There are over sixty very active members in U-control flying. There are five meets scheduled for the 1950 calendar, but the dates are uncertain as yet.

Iowa

The Iowa City Gas Hawks recently sponsored the first indoor contest in their area. They are doing everything to help keep up interest during the winter, and making an effort to build all kinds of model airplanes—not to get into a rut as many clubs have. Lawrence H. Conover, president, and members are looking forward to warmer weather and more meets so that they can show what they really can do.

Kentucky

Results of club elections of officers for this year are still being received, this time

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from the Louisville A. B. C. Model Club. Harvey Green takes over the presidency, Charlie Keeling is senior vice president; Carl Carrico, junior vice president; Stan Brenner, secretary; and H. O. Wise, treasurer. The club is trying a different approach to its problems. A list of objectives for 1950 was compiled (such as contests, race-track refinishing, club-owned radio models, etc.) and one member was put in charge of each project to give progressive reports at every business meeting.

Maine

We guess the last of the results of elected officers for 1950 have arrived. Four clubs from this State have sent in their returns. Here they are:

New president of the Waterville Flying Aces is Donald Begin; Angelo Gagliano will assist as vice president; James Begin handles the secretary's job; and Richard Roy makes certain the dues are paid on time.

Members of the Lewiston Sky Devils have confidence in Tommy Beauchemin as president; Roy Gove as vice president; Everett Wakefield as secretary; Leon Auger as treasurer to guide them on the right path this year.

George Brann, president; Clarence Rackliff, vice president; Ronald Brann, secretary; James Christenson, treasurer; and Walter Brann, publicity man, will guide the Gardiner Flying Tigers.

Our last list of elected officers for Maine comes from the Augusta Flying Maniacs, who publish the monthly bulletin, TALE-SPINNER. Stanley B. Davis has been president for a month or two now, with capable and hard-working assistants Harlan Rollin, vice president; Louis Marden, secretary; James Clark, treasurer; and Howard Smith, publicity director and corresponding secretary.

Maryland

The goal of The Dundalk Model Airplane

Club is to furnish one of the contestants for the Plymouth Meet, which will be held at Detroit this year. With a recently constructed club training airplane, they have successfully trained eight members on this original design ship, and only had one slight crack-up. Directly across the street from their sponsor, the local Chrysler-Plymouth Dealer, they have their own flying field with two circles—50' and 70'.

Missouri

Another inactive - because - of - the - war club, Kirkwood Thermaleers, is resuming its activities by holding bi-weekly meetings (to catch up for lost time, we suppose) in the Grace Church House in Kirkwood. The building and flying of indoor microfilm models is presently taking the members by storm, and by spring they should have a top-notch team to send to the Nationals and Internationals. Although plans are not yet completed, they hope to obtain the use of one of several excellent large buildings in St. Louis for future indoor flying sessions and contests. All model enthusiasts in the greater St. Louis area who are interested in indoor and outdoor flying are invited to contact the secretary, George De La Mater, at 9715 McDowell Place, Overland 14, Missouri, for further details.

New York

The Olean Model Airplane Club would like to voice their opinions on the different phases of modeling as have so many other clubs through our Club News column. We quote from secretary Alfred L. St. Clair's recent letter:

"First, we should like to see the AMA rules released by the first of the year to give modelers a chance to cope with any drastic changes in designs.

"Secondly, the rules should be revised and made for the modeler and not the contest director.

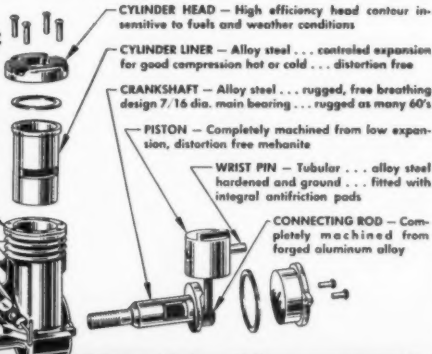
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"We would like to see the return of the cross section, and wing and power loading limitations. However, we feel the cross-section should be L² x 75 instead of 100.

"We would also like to see the enforcement of the landing gear requirements in all contests, and all contests strictly R. O. G.

"Further, we do not want to see any reduction of the classes in free flight, but more competition in the larger classes."

Mr. St. Clair comments that he, representing his club, would like to hear what other clubs have to offer along these lines.

Over 250 contestants participated in the Indoor Model Airplane Meet, December 11, 1949, which was held at the Central Armory, Cleveland, and sponsored by the Cleveland Women's Chapter of the National Aeronautic Association, the CLEVELAND PRESS, and local model airplane shops. Here are the winners:

Gliders Open—George Jensen and R. Obarski (tie) :37.3; Sr.—Paul White :30.4; Jr.—John Humphreys :29.3; Novice—William Ward :26; Rubber (all types of models) Open and Sr. Combined—Nick Ricciardi :3:12.8; Jr.—John Humphreys 4:00; Novice—Robert Petrushka 2:04; Microfilm Stick Open—R. W. Obarski 11:47; Sr.—Nick Ricciardi 7:05; Jr. and Novice Combined—John Humphreys 7:38.5; Microfilm Fuselage Open—R. W. Obarski 6:17.6; Sr.—William Davis 1:08.7; Jr. and Novice Combined—John Humphreys 4:00.1.

Pennsylvania

Clarence Wells, who formed the Terrible Torques, of New Hope, and the Bristol Aeromodelers, of Bristol, has a third club on the way—The Croydon Cloudbusters. Anyone interested in joining one of these clubs may write to Clarence at either of the following addresses: 1300 Dixon Avenue, Croydon, or Post Office Box 5, Bristol, Pennsylvania.

The Bristol Aeromodelers have given team racing top billing. Their main trouble, however, in running races is getting all the engines started on time. They begin with a line-up of five models, but only two or at best three, get off in the race. Electric starters seem to be an absolute necessity. Of course, like the majority of model clubs throughout the country, they are making plans for the Nationals.

Wisconsin

Here's another new club—Waukesha Gu Bugs! Bill A. Oeder writes that there are thirty-four active members and meetings are held every other week. Sorry, we can't tell you more about this newly-organized group's ideas, but they are just getting started.

Canada

René Charette, who invented the Airmobile, is planning a new organization to be known as the I. M. A. E. (International Model Aircraft Experimenters). Membership is open to those who enjoy building and flying model airplanes regardless of age and experience. A number of design features incorporated in the Airmobile will be submitted to members for further development and research. Mr. Charette says that members will be encouraged to send in monthly reports on their own experiments to MODEL AIRPLANE NEWS, subject to approval by him, however. He wishes to point out also that the purpose of the I. M. A. E. is not to break records. For more information, write to Mr. Charette, at 213 Bessner Street, Ottawa, Ontario, Canada.

Eliminate the Gyroscope

(Continued from page 33)

to soften up the dope, and pin it down securely in the jig. Allow it to remain in the jig over night in order to set.

With the left wing having 3/8" more incidence at the dihedral joint than the right wing, the ship will tend to roll to the right at high speeds. Now, give the engine enough left-thrust to make the ship climb in a left circle. As more and more power is added, more left-thrust will have to be added to keep the ship turning to the left.

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- How can a plane be made laterally stable?
- How to prevent spiral dives?
- What size propeller should be used? ETC. . . . ETC.

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But, the airplane will show remarkable resistance to spiral dives to the left.

Next, start turning the engine so that the airplane climbs to the right. The tendency of the ship to roll to the right caused by the greater angle-of-attack of the left wing than the right wing, will cause spiral dives; and the ship will appear to be "spirally unstable" in a climbing right turn.

(The ship will tend to glide in a left circle due to the drag on the warped left wing at low speeds. In fact, too much warp will cause a spin in the glide, but this factor is not being discussed here, and is mentioned only as an explanation of a by-product of the experiment that might puzzle the experimenter.)

After enough flights have been made with a warp in the left wing to thoroughly convince the flier that the ship is "stable" in a left-hand climb and "unstable" in a climbing turn to the right, the wing should be placed in the jig again to take the warp out of the left panel and put an identical warp in the right wing panel. Now, by again moving the thrust from one side to the other, as described above, the ship will prove to be "stable" in a right-hand climbing turn and "unstable" in a left-hand climbing turn. (The airplane will now glide in a right circle.)

This entire experiment must be made at very high speeds in order to prove anything, for a slow climbing ship will generally have enough true stability in its design to correct all but the most tremendous errors in adjustments.

And, before some poor unsuspecting modeler blames me for smashing up his models by urging him to experiment, let me warn you not to go in for experimental work unless you are willing to sacrifice a half-dozen models in the interest of furthering your knowledge. It is necessary to do a pretty thorough job of testing in order to be sure that your results are correct. For those fliers who are not willing to smash up ships to find out things for themselves—take the word of a dope that has done the job and gained his knowledge the hard way.

Dozens of my pretty ships, splattered all over the landscape have proven that you can absolutely "ELIMINATE THE GYROSCOPE" when seeking the cause of a spiral dive.

XP-81

(Continued from page 23)

cement liberally. The lower fuselage block is notched with a coping saw to receive complete wing and landing gear assembly. The flat bottom of the wing should be parallel to the thrust line, which is the same as the fuselage center line. Check this with care by turning the fuselage upside down, setting it on a flat surface, and using dividers or a surface gauge.

Plug up notches on the fuselage bottom with balsa scrap. Cover the entire wing with 1/32" x 4" sheet balsa. (Glue narrow sheets together, if you can't obtain 4" wide stock.) Round off at leading and trailing edges. The wing tips are added last. Install lead wire guides as shown.

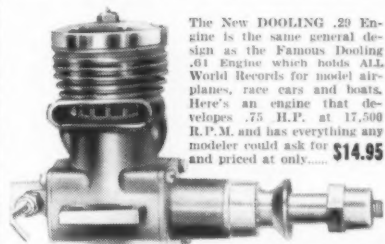
The ship is now ready for painting. Seal the surface with two coats of clear dope, and then sandpaper lightly. Paint the surface with primer and use No. 400 wet or dry sandpaper to prepare for final coating. The entire plane is painted with silver lacquer or dope. Cement the plastic canopy in place and use masking tape to paint the black anti-glare panel on the nose of the ship. Paint the black ring as shown at station zero, to represent an air intake for the front jet engine. The air scoops behind the cockpit are also painted black on the entrance port. Add U. S. Army insignia decals—1-1/2" dia. star on both sides of the fuselage near the tail. Also, put one on the upper left wing, and on the lower right.

Solder brass clips on the landing gear and attach aluminum alloy wheel-well covers with No. 2-56 screws. The 1/32" dia. steel lead wires are installed next. Then the aileron and flap outlines are drawn with black dope, using a ruling pen. Trim down a standard 3" long x 1-3/4" dia. racing spin-

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ner to the size shown. A four-bladed propeller is shown in the illustrations, but an Ohlsson Pow-Or prop of 8" dia. x 9" pitch propeller is recommended for flying.

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Scrap Box

(Continued from page 9)

down). A little Diesel model was pranged every night for three weeks' running, but with the aid of long letters from the states, Hewitt began to stunt in earnest.

"I won every contest entered that year," he recalls, "excepting one where the lines broke. I used a Hot Rock, from M.A.N. plans, with a McCoy Sportsman Junior. I still hadn't done vertical eights and was only then beginning square loops. Our point schedule was a fearsome thing with some 1,030 possible points, but I never made more than 900 odd.

"This year the schedule was modified to agree with yours," goes on Hewitt, "and I think this was a pity because—and I know this is contradicting a lot of your correspondents who think stunt is still in its infancy here—you see a procession of chaps going straight through the book, with the judges looking for one loop that isn't in the same groove as the other four.

"But I would like to say thank you for all you fellows did for me. It started when I wasn't getting anywhere and it took me through from there until the day this past summer when I became the proud owner of the National Stunt Champion title, scoring 295 points out of 295."

What say, men, shall we turn up the "tall" knob for the next story. As they say on the radio thrillers, "You asked for it!" Carl Stokes, the same Seattle lad, tells this one. "I think," begins Carl, "that most modelers have had the joy of ships being

returned after a lost flight but in my case it is just the opposite.

"About six months ago, I was messing with a Class C rubber job. No matter what I did to it, it got worse, consistently spinning in on the glide. After two hectic test flights one Sunday, I was holding on for dear life while my pal, Jim Amis, put in the winds. Wang! The hook tore out of the chuck and left me with a mess of pieces and a cut hand. I lost control of myself and stomped the ship to ruins. I was so mad I even forgot to burn it!

"About three months later, I awoke one morning and found a big package from the airport manager. Excitedly I ripped open the mysterious package. There was my mangled model with a note: 'Found, in this condition, at Auburn Airport!'

That reminds us of one father-son deal that probably came a cropper—at least as far as models were concerned. This charming picture took place at the 1937 Nationals in Detroit. (Yes, C. O. Wright, Elmer was there!) Son let loose his free flight. Like half the free flights used to do it wound right back at him and bounced into large fragments at his feet. Son jumped up and down. Father, angry at such poor sportsmanship (or was it the wasted spending money?) ran over and stomped the ship into minuscule pieces, as if to say, "That will cure you of that temper, sonny boy!"

Anyway, one free subscription for Carl Stokes, of the Northwest, for the best tall but true story of the month.

Flash

(Continued from page 5)

actually building a convertiplane. M. A. Guerrieri is busy in the back of a hanger with two mechanics putting together a convertiplane which consists of two outrigger propellers that are vertical for vertical flight and heel over in flight to act as propellers. Guerrieri says the project is merely a hobby and he has no serious

plans. But both Air Force and Navy say as soon as the advantages of a true convertiplane have been clearly demonstrated, they'll be interested, so Mr. Guerrieri's experiment may yet pay off.

WITH THE LOW state of the personal aircraft business, the industry recently leaped at an Air Force design competition for two-place liaison aircraft for the Army Ground Forces. Just to give you an idea of how hard-pressed the industry is, here are the companies that entered designs: Aerona, Boeing, Convair, Cessna, Piper, Taylorcraft, Temco, Jamieson, Aerobat, Emigh, Johnson, and Aero-Flight. Toughest part of new specification is an operating speed of only about 40 mph for hovering while spotting, handling messages, etc. This is a "slot-and-flap" design job that requires plenty of knowledge and experience, which few of these companies have, since all have shunned such expensive devices in their non-military models.

AIR FORCE learned during World War II that finding out how effective a bomb raid was is just as important as dropping the bombs. Equally as important, too, was "casing" the target in advance by taking pictures, preferably without the knowledge of those down below. To solve this problem, "photo reconnaissance" types were developed especially for the job, notably the Hughes XF-11, Republic XF-12, Northrop XF-15, and others. But with the huge Convair B-36 bombers operating to targets 5,000 miles away, the Air Force quickly decided that the only airplane that could accompany these bombers to take pictures of their targets was another B-36! The new Convair RB-36 (reconnaissance-bomber) is a standard bomber but with its No. 1 bomb bay crammed full of 14 different cameras, one of which has a 48-inch focal length! Air Force is buying 67 RB-36E photo-recon versions to outfit two photo-recon groups. Ultimate Air Force program is for four B-36 bomber groups and two RB-36 photo-recon groups.

HIT OF THE 1950 Miami All-American Air Maneuvers was the French Fouga Cyclone jet-propelled glider (see MONTHLY AIRPLANE NEWS, February, 1950, issue). The trim little sailplane was put through its aerial paces by Fred Nicole, French pilot, and attracted considerable attention. Its performance was given official blessing by the daily appearance of Gen. Charles Lutzin, French Air Attaché in Washington, who described its maneuvers over the microphone. A sales price of \$9,000 was revealed at the show, which puts the high-performance craft in about the same class as current U. S. four-place executive planes. As has become a habit at all air races, veteran S. J. "Steve" Wittman carried off the prize money and the trophy in the closed-course racing, and averaged 183.4 mph over ten laps of the 10-mile course, a considerable increase over his 176 mph average at the 1949 National Air Races.

U. S. AIR LINE transports may go way back to 1911 for a safety idea: an airborne spotlight. Civil Aeronautics Administration has completed experiments with a powerful spotlight in the nose of a Douglas DC-3 transport. The light oscillates left and right through a 120° arc and is visible for 18-20 miles. Not to be confused with landing lights, the new nose lights are intended to prevent aerial collisions by warning all aircraft of the presence of a passenger transport in the area. CAA is giving serious consideration to making use of the light mandatory on all scheduled air transports. Such a device was strongly urged after the two tragic accidents to air liners, one by a Grumman fighter and one by a surplus Lockheed P-38 fighter, both of which rammed Eastern Air Lines transports in mid-air. Aerial spotlights were first carried aloft in 1911 by sport pilots simply as a novelty but later, in 1919, as an air warning by air mail pilots.

WHENEVER U. S. air transport manufacturers are ready to produce jet transports, the engines are ready. The Allison J-33 turbo-jet engine, of 4,000-lb. thrust, was certificated by the CAA for commercial sale last year. Now the powerful General Electric J-47 axial-flow turbo-jet engine, of 5,000-lb. thrust, has been approved

U-CONTROL - IT KITES

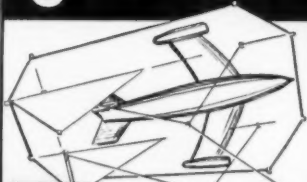
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DEATH OF GENERAL "Hap" Arnold takes one of the real pioneers of aviation from the scene and robs the U. S. Air Force of its real creator and guide to its present position of pre-eminence as the Number One Weapon of our armed forces. A bill has been introduced in the Senate to name the new U. S. Air Force Engineering Development Center after Gen. Arnold. We certainly agree that this would be a fitting tribute to this great pioneer. The new center is located at Camp Forrest, near Tullahoma, Tenn., and is designed to become the Air Force "supersonic Wright Field." It will contain a variety of supersonic wind tunnels, special jet engine testing laboratories and a guided missile experimental range.

ONE OF THE real competitive battles has been that between the Douglas AD Skyraider and the Martin AM Mauler attack planes. Both were designed to perform the same mission carrying the same armament and bomb load, etc. Yet the Douglas AD is powered by a Wright R-3350 engine of only 2,500 hp whereas the Martin AM has the giant Pratt & Whitney R-4360 engine of 3,500 hp. As the procurement schedules were published, the outcome of the battle became all too clear as orders for the Skyraider piled up to well over 500, while only 150 airplanes of the Mauler type were procured. Now we note the final outcome of the contest with announcement that 82 Maulers have been turned over to six different Naval Reserve training units while new orders are still being received for the Skyraider, notably the new AD-4 with Wright compound engine.

WE ARE getting pretty used to 500 mph speeds in connection with jet fighters but Paul Mantz reports that on his recent record-breaking flight from Burbank, Calif., to New York of 4 hrs. 52 min. 58 secs. he averaged 580 mph between Omaha, Neb., and Chicago, Ill. His average speed for the trip was just about 500 mph, which is much faster than we thought a propeller-driven North American Mustang of World War II vintage could fly! Mantz announced that he no longer thought the trip had any significance in Mustangs since the time all depended on the weather along the route. He pointed out he only beat Joe De Bona's time by 7 min. 7 secs., in a similar airplane. So, it looks like 500 mph signals the absolute end of the propeller-driven airplane . . . from here on it's jet!

AMERICANS HAVE been brought down hard on their heels by the Royal Air Force statement that "No thanks, we can't use any of your B-29's!" USAF had made plans for supplying up to 200 surplus Boeing B-29 bombers to England as part of the billion-dollar arms aid program to Atlantic Pact nations. The RAF had trimmed this number down to 20 and now announces they don't want any. Reasons are that the presence of such U. S. airplanes would create an enormous spare parts, overhaul and repair problem and the fact that crew training in operation and service of the planes would require about two years to make it a really effective weapon was impractical since the RAF's own jet bombers would be ready by that time. So the decision is: no B-29's for Britain. And there are further indications that there will be no combat planes at all in the entire program. Two factors influence this decision: the Russians might get them and the USAF believes it can fly the airplanes to Europe overnight in the event of war, so why ship them over now?

THE LONG-FAMED name of Bellanca may again be heard in big airplane circles if the Air Force looks kindly at some new designs submitted by the veteran airplane designer. Bellanca has submitted designs for a 300,000 and 350,000-lb. cargo transport to the Air Force for possible experimental production. These are "bigger than Convair C-99" size giants, in contrast to the small four-place Crusair personal aircraft the company now has in production.

BUILD IT YOURSELF!



RADIO CONTROL D-E AEROTROL

Now Available in Kit Form

ONLY \$19.95
COMPLETE
(less tubes and batteries)

YOU can now assemble your own radio control unit from completely fabricated parts. A pair of pliers, screwdriver, and soldering iron are the only tools required. Here is what you get in the complete kit:

TRANSMITTER: Stamped and formed chassis with all holes punched; all necessary electronic components, resistors, condensers, coils and chokes, ready for installation; keying switch, soldering lugs and hardware; plywood case, color coded wiring, plus the dipole antenna wire.

RECEIVER: Drilled bakelite receiver base with condenser and all eyelets attached, super sensitive D-E Relay ready for installation; all electrical components, condensers, resistors, coils, potentiometer and chokes, ready for installation; all necessary contacts, and color-coded wiring.

ESCAPEMENT: Coil assembled to ready made frame, all other parts ready for assembly.

INSTRUCTIONS: Separate step-by-step assembly instructions for each unit, plus the big 24 page illustrated instruction manual on adjusting, maintenance and installation.

TRANSMITTER: 50-54 megacycle frequency, range from 2 to 6 miles. This unit uses battery power, 3A5 tube, weighs only 6 ounces. Size 1 1/2" x 2" x 4"

COMPLETE ASSEMBLED D-E AEROTROL
(with tubes)
COMPLETE UNIT \$49.50
CLUB UNIT \$29.50
(receiver, relay and escapement only)

D-E AEROTROL IS FLIGHT PROVEN!

D-E AEROTROL is light, small, and compact. Single channel installation can be made in models as small as 36" wingspan. This set will easily operate over a 2 1/2 mile range. Frequency can be adjusted between 50 and 54 mc. for multiple channel installations.



ESCAPEMENT: Self Neutralizing, Rubber Powered. Weighs only 1/2 ounce. It will operate on a steady signal from the transmitter. Outside static and interference will not affect it.



RECEIVER: Weighs only 1.9 ounces, complete with relay. This set uses the RK-61 tube. The flying weight complete with batteries is 4 1/2 ounces.

Build These Models For Radio Control!

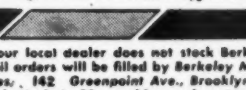
SUPER BUCCANEER - \$9.95

For .60 to 1.20 Engines. 7 1/2 foot Span. This winner of over 200 contest prizes is ideal for radio control experimentation.



CUSTOM CAVALIER - \$17.50

For .60 to 1.20 Engines. 9 foot Span. Equipped with a tricycle gear and slotted wing, this model can lift a 4 1/2 lb. load.



SUPER BRIGADIER - \$3.95

For .19 to .36 Engines. 58" Span. First gas model designed specifically for PAA-Load and Radio Control Flying.



SOLD THRU
BERKELEY
DEALERS & DISTRIBUTORS

If our local dealer does not stock Berkeley kits, mail orders will be filled by Berkeley Model Supplies, 142 Greenpoint Ave., Brooklyn 22, New York. Include 25c. packing and postage.

TERRIFIC!

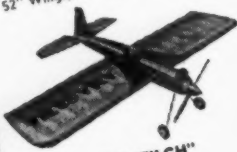
TWO GREAT NEW PREFABRICATED MODELS - BY

Berkeley

These two new models cover the whole field of small engines, from .020 to .23! They're real fun to build and fly!



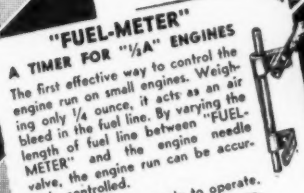
"SUPER-DUPER ZILCH"
.45 to .65 Engines
52" Wingspan \$5.95



"LIL-DUPER ZILCH"
.19 to .29 Engines
42" Wingspan \$3.95



"PEE-WEE ZILCH"
.045 to .099 Engines
32" Wingspan \$2.50



"FUEL-METER"
A TIMER FOR "1/4 A" ENGINES
The first effective way to control the engine run on small engines. Weighing only 1/4 ounce, it acts as an air bleed in the fuel line. By varying the length of fuel line between "FUEL-METER" and the engine needle valve, the engine run can be accurately controlled.
"FUEL-METER" is simple to operate. It can also be used with larger engines in conjunction with a timer as a fuel shut-off. Priced so low, you can't afford to fly without one. Only 50c



"POLYTHENE" FUEL LINE
The new transparent tubing that resists all model engine fuel. Extruded from the new lightweight Dupont miracle plastic, Polyethylene.
For all size engines - 15c per foot



"PROFILE PUDDLE-JUMPER"
Berkeley's midget size pre-fabricated sport-stunt model. 19" wingspan, for .020 to .049 gas engines, and 3/16" bore COs engines. \$1.00



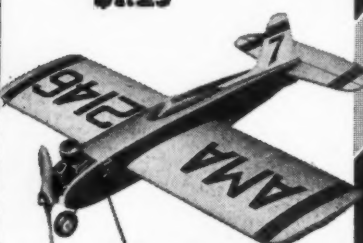
"MINI-ZILCH"

The first contest performing stunt controller for .020 to .049 engines. Designed by JIM SAFTIG, National and International Stunt Champ, the "Mini-Zilch" has a 20 1/2" wingspan, weighs only 5 ounces complete.

This model makes indoor stunting possible. It can do the complete flight pattern of aerobatics on lines as short as 20 feet.

Simple to build, this kit is completely pre-fabricated. The fuselage is built up from cutout sheet balsa parts; the tail is cut out of sheet balsa; the wing has ready cut ribs, full span spar; the landing gear is ready made, with lightweight plywood wheels; complete genuine Jim Walker U-Control®. Hardware includes an aluminum bell-crank and elevator horn, cloth hinges and a formed wire pushrod.

\$1.25



"SENIOR" PUDDLE-JUMPER

BASIC CONTROLLER TRAINER FOR .074 TO .23 ENGINES - 25 1/2" SPAN

This model was designed for quick and easy construction. Test flights proved it to be the easiest controller to fly, regardless of power. On the very first flights you can do loops and wing-overs. After a few hours flying the "Senior Puddle-Jumper," you will be ready to advance to the championship performance of a "Zilch".

The kit is completely pre-fabricated; the fuselage is completely cut out ready for assembly; the wing has shaped and notched leading and trailing edges, shaped balsa tips, and cut out ribs; cut out sheet balsa tail; formed wire landing gear with rubber wheels and spade mounting bolts for easy attachment to the firewall; plastic bubble canopy; plywood firewall; complete Jim Walker U-Control®. Hardware includes an aluminum bell-crank and elevator horn, cloth hinges and formed wire pushrod.

*Manufactured under license, Jim Walker "U-Control" Patent No. 2292416, and other patents pending.

\$1.95

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BERKELEY
DEALERS & DISTRIBUTORS**

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LATEST BERKELEY CATALOG 25c

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**APRIL 1950
MODEL AIRPLANE NEWS**



"Rite Pitch" WORLD RECORD BREAKER

"RITE-PITCH" Wins Everywhere . . .

MORE CONTEST WINNERS USE
"RITE - PITCH"
THAN ALL OTHER MAKES COMBINED

C. M. HOLT, ADC, USN. in a recent official A. M. A. meet, set a new world's endurance record using a "RITE PITCH" Prop 11-8. Time of the flight was one hour, sixteen minutes and 33.8 seconds.

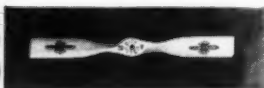
Propellers

REGULAR "RITE-PITCH"
World's Finest Gas Model Propellers



UNDISPUTED SUPREMACY!
QUALITY UNSURPASS-
ABLE! Sensational, new engi-
neering scoop! New 1950
"RITE-PITCH" World's FIN-
EST GAS MODEL PROPELL-
ERS. Advanced design! Im-
proved! Tested.

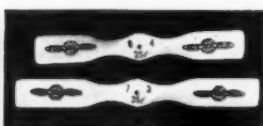
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NEW "RITE-PITCH"
SUPER STUNT PROPELLERS

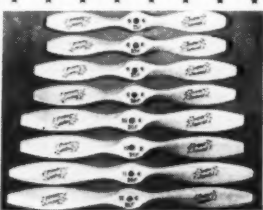
Wide Blades, Square Tips for
SUPREME PERFORMANCE
IN STUNT FLYING!!!

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<input type="checkbox"/> 14"-8	35



"RITE-PITCH"
CO2 SPECIAL PROPELLERS
Designed especially for Herk-
mer CO2 Motors. Same gener-
al design as "SUPER-STUNTS"

<input type="checkbox"/> 6"-4	35
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"SUPER-SPECIAL 25"
PROPELLERS

World's lowest-priced quality
propellers - Terrific mass pro-
duction methods make this
price and quality possible. Ev-
eryone completely finished,
hand-sanded, lacquered and
balanced.

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<input type="checkbox"/> 8"-8	25
<input type="checkbox"/> 9"-6	25
<input type="checkbox"/> 9"-8	25
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<input type="checkbox"/> 10"-8	25
<input type="checkbox"/> 11"-6	25
<input type="checkbox"/> 11"-8	25

NEWEST!!! ROBERTS'
LITTLE-PROPELLERS

For the New Little Motors.

<input type="checkbox"/> Infant	25
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<input type="checkbox"/> Cub For 049	25
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<input type="checkbox"/> Cub 099	25

DEALERS - All leading jobbers can fill your orders promptly, or write us.
JOBBER - All nationally advertised "RITE-PITCH" products are avail-
able before advertising ORDER TODAY!

REG.
U. S.
PATENT
OFFICE

Bob

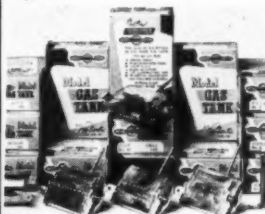
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32 West 5th Ave. Gary, Indiana

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Roberts' products
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MODEL GAS TANKS

Largest most complete line of ready-to-use
tanks in the world!!! All at World's lowest
prices.



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Vertical Tanks

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<input type="checkbox"/> No 6 Large	60		

Square Tanks

<input type="checkbox"/> No 7 Small	60	<input type="checkbox"/> No 8 Med	60
<input type="checkbox"/> No 9 Large	60		

Clockwise Stunt Tanks

<input type="checkbox"/> No 10 Small	60	<input type="checkbox"/> No 11 Med	60
<input type="checkbox"/> No 12 Large	60		

Counter-Clockwise Stunt Tanks

<input type="checkbox"/> No 13 Small	60	<input type="checkbox"/> No 14 Med	60
<input type="checkbox"/> No 15 Large	60		



Wedge Tanks

<input type="checkbox"/> No 16 Baby	60	<input type="checkbox"/> No 17 Junior	60
<input type="checkbox"/> No 18 Senior	60		

"Thimble-Spur" Race Car Tank

<input type="checkbox"/> No 19	60
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Midget Wedge Tanks for the New Smaller
Motors

<input type="checkbox"/> No 20 Midget	60	<input type="checkbox"/> No 22 Junior	60
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Model Hobby Cement

NEW FORMULA 11
MIRACLE CEMENT



Today's Sensation Among
Model Builders! FORMULA 11
has everything - everything
a cement should have for care-
ful craftsmanship: for cham-
pionships in any class. Strength
ease of handling - extra fast dry-
ing and 15 quality ingredients labor
intensive! Test FORM-
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work clean in fast FORMULA
11, at only 10¢ a tube, look for
it on your workbench.

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FORMULA 22

This new sensation, a compari-
son of Formula 11 does every-
thing you can ask for when you
want a cement that is the
strongest in the world, and yet
is fast drying. The amazing
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makes any job you do easier
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READY SOON!!!!

Formula 11 and Formula 22
Cements will Soon Be Ready
in World's Largest 25¢ Tubes.
Same fine quality as usual.

HERE'S THE



As the world's largest manufacturers of model engines, OHLSSON & RICE have a vital interest in the fuels to be used in O & R Engines. Constant tests are run to determine both the performance and effects of using different types of fuel. Again and again, these tests have shown that specific purpose fuel is absolutely essential for both performance and protection to the engine. Just one of many laboratory tests confirming these facts is shown here in actual photos.

ENGINE "A" was run for only *one hour* on a leading advertised brand of "non-specific" fuel. Notice the amount of sludge, gum and engine varnish accumulated on the piston and in crankcase—even during this short period!

ENGINE "B" ran 8 hours and 40 minutes on O & R Supreme No. 2 Fuel for O & R and other lapped piston engines. The crankcase and piston are perfectly clean and gum-free—even after *eight times* the length of run!

This gum, sludge and engine varnish—plainly visible in crankcase and on piston—show what happens *inside* your engine when non-specific or non-recommended fuels are used. By ignoring this "inside story" thousands of modelers are risking irreparable damage to their engines.

The exclusive, specific-purpose ingredients in O & R No. 2 Fuel for Lapped Piston Engines *keeps* them clean and free-running throughout a long life of peak performance. Similar quality ingredients in other O & R Fuels, designed for Ring type and "AA" engines, assure comparable performance with these engines. To be sure of "protected performance" in *your* engines always insist on the correct specific purpose fuels for each engine.

Make Your O & R Model Midget Car Even More Realistic... The NEW O & R DRIVER—durable, cast, super-detailed figure—at your Hobby Shop **\$1.50**



Car \$5.95 — with Engine \$19.95

O & R Specific Fuels for Specific Purposes
Prepared in conjunction with one of the world's largest producers of chemicals

- NO. 1. Lapped Piston Ignition Engines!
- NO. 2. Lapped Piston—Glow Plug
- NO. 3. Piston Ring Ignition Engines!
- NO. 4. Piston Ring Glow Plug!
- AA Class "AA" Engines!

30 PLUS To Tailor Your Fuel to Conditions!
ECONOMY 2&4 Economical Operation While Flying for Fun!

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